

Karl Pearson

DEPARTMENT OF APPLIED MATHEMATICS
UNIVERSITY COLLEGE, UNIVERSITY OF LONDON

DRAPERS' COMPANY RESEARCH MEMOIRS

BIOMETRIC SERIES VI

A MONOGRAPH ON ALBINISM IN MAN

BY
KARL PEARSON, F.R.S., E. NETTLESHIP, F.R.C.S.,
AND
C. H. USHER, M.B., B.C. CAMB.

TEXT

PART I

WITH FRONTISPIECE AND FACING PLATE

PROVISIONAL PREFACE AND PAGES 1—266

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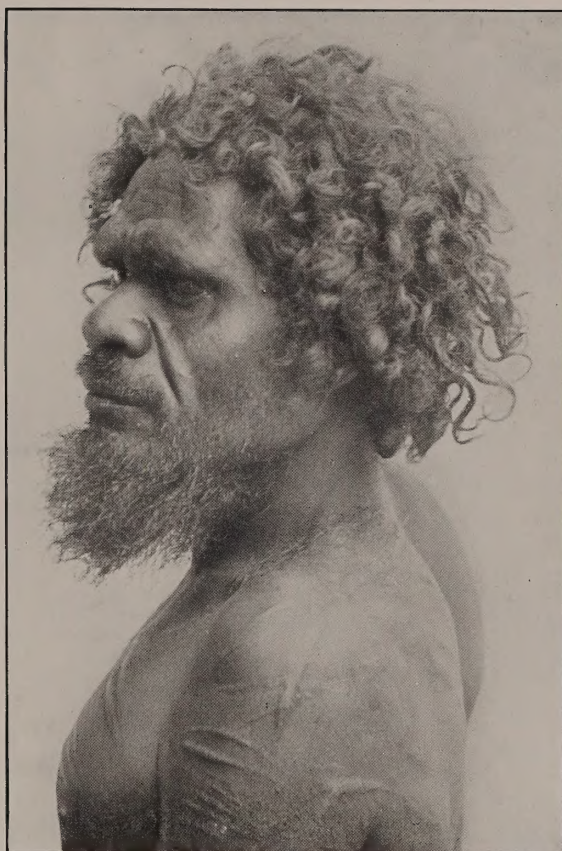
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CALTON LAA FOLIOS 73



AUSTRALIAN ALBINO.

(1)



NORMAL AUSTRALIAN NATIVE, WORKII TRIBE,
GILBERT RIVER, QUEENSLAND.

This and our frontispiece are from photographs by Messrs Kerry and Co., Sydney. Reproduced by kind permission of Messrs Kerry and Co. and Messrs Hutchinson and Co. (*Living Races of Man*, Vol. I. p. 61). See our pp. 101-2.

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PROVISIONAL PREFACE

IN issuing this first section of our monograph on albinism we have been guided by two considerations. In the first place further delay might suggest that it would never appear at all, indeed such a suggestion has already done some harm, and in the second place the very great expenditure involved in its production has led us to issue our work in instalments. We are, perhaps, more conscious than any of our readers can be of the disadvantages of this step, but we cannot but believe that they are counterbalanced by positive gains.

In regard to the first point, we feel that we ought to acknowledge, within a reasonable time, the invaluable assistance we have received from medical men and other friends in all parts of the world. Only owing to their kindness has it been possible to collect such a mass of illustrative data, anthropological and physiological, as is provided in this section of our work. Further, we hope the appearance of this section will to some extent direct inquiry into the channels where we believe from our experience that observation and research will be most profitable. There is much yet to be learnt with regard to albinism in all its forms, and although we have spent many years over this monograph, we acknowledge that the amount to be learnt by both observation and experiment is far in excess of what we have been able to place before the reader.

In the second place the great expense involved in the production of this volume is one that we can only endeavour to meet in relays. The main charge has fallen on the funds placed at the disposal of the Department of Applied Mathematics at University College, London, by the Worshipful Company of Drapers; a further contribution to the expense of drawing the pedigree plates was made from the Treasury Grant for Research to the University Colleges; finally, a sum only slightly less than the total of these has been provided by the authors themselves, towards the cost of illustration. It is with a view to providing funds for the further printing of the monograph, that this section is now published. It will be issued solely to subscribers, who are willing to take the remaining sections on their appearance.

These remaining sections are in an advanced state. The chapters on the Albinotic Eye in Man, on the Albinotic Hair in Man, on the Albinotic Eye and Hair in Animals are all ready for press. The chapters on the correlation between albinism and other defects, on heredity of albinism, and on the statistics of albinism are practically ready. The whole of the Appendices containing the detailed descriptions of albinotic families, the bibliography of albinism and the third section of the Atlas containing fifty-four plates with more than 650 pedigrees are printed off. The second section of the Atlas containing the coloured plates, maps, etc. is also ready. We are therefore fairly confident that the final issue can be made in the course of 1911.

The sections now issued embrace : (i) Introductory Chapter, (ii) Early Historical Notices, (iii) The Geographical Distribution of Albinism, (iv) The Albinotic Skin, (v) Leucoderma, and (vi) Partial Albinism, Piebalds. We are very conscious of how much in these chapters depends for confirmation on what is already written, but not yet issued. We refer repeatedly to later chapters, or to individual family pedigrees or to our bibliography. The circumstances under which this part is issued render these defects unavoidable ; we can only ask our readers to assist us in hastening forward the work by obtaining additional subscribers.

In issuing the first part of the Atlas, namely, photographic Plates A—Z and AA—ZZ with this section, we are fully aware that the reader will find no reference to certain of the photographs—notably those of animals—in the present section ; they are fully discussed in later chapters, and their presence in the first part of the Atlas is merely to maintain the order of plate-lettering, a lettering which has been adopted in the course of the five years or more during which the work has been in progress. The final section of the monograph will comprise not only a complete name, place and subject index, but a complete list of the 120 plates which will accompany the work.

It is necessary to give here some indication of the relative shares taken by the three authors in this memoir. The scheme originated with K. Pearson who, soon after initiating the work, proposed to E. Nettleship that he should assist in collecting albino family histories. The work rapidly grew in extent and scope, and the large number of contributions made by C. H. Usher to the stock of family pedigrees as well as the albinotic data gathered by him in his voyage to the East, led to his early association with the original scheme. The proofs of all parts of the present section have been seen by the joint authors ; the labour of composition had to be performed by one of them (Karl Pearson), although in some instances it only amounted to overwriting what had been contributed by his colleagues or other friends and helpers in order to bring the material to a more homogeneous whole. As the monograph

stands now, K. Pearson is chiefly responsible for the final form of Chapters I, II, IV, V and VI, although E. Nettleship collected much of the original material of Chapter VI. In Chapter III there is a greater division of responsibility, K. Pearson being more responsible for the historical portions, and C. H. Usher for the sections on albinism in the Pacific. In the remainder of the work, E. Nettleship with the assistance of Mr George Coats deals with the eye, K. Pearson with the assistance of Dr F. H. Scott and Miss E. V. Thompson with the hair, and E. Nettleship and C. H. Usher with the eye and partly with the coat in animal albinos.

Beside the innumerable helpers whose contributions are acknowledged on almost every page of the geographical chapter, we have specially to record the splendid work done by Miss Joan Kingsford and Miss Kathleen V. Ryley in drawing up the pedigree plates, and by Miss Amy Barrington and Miss Julia Bell in abstracting and discovering references to albinism by a great variety of unexpected authors and in many obscure journals.

KARL PEARSON.
E. NETTLESHIP.
C. H. USHER.

December, 1910.

ADDENDA AND CORRIGENDA

P. 48. *Persian Albinos*. Dr E. N. MacBean Ross in a letter of October 20, 1910, to K. Pearson from Dehkurd, Persia, states that after inquiry from European doctors, native *hakims*, and among harem ladies, he has not been able to come across anyone who has seen or heard of a Persian albino.

P. 144. *Mozambique*. Jean Mocquet, in his *Voyages en Afrique, Asie, Indes orientales et occidentales*, Rouen, 1645, Book iv. pp. 254—7, reports a case of a negro albino. Full details will be found in our Extra Pedigrees, Appendix A.

P. 187. *Meirowsky's Conclusions*. Since our chapter on the Albinotic Skin was printed off, Meirowsky's results have been criticised by Jäger. In "Die Entstehung des Melaninfarbstoffs" (*Virchows Archiv*, Bd. 198, S. 62—92) he devotes S. 81—85 to Meirowsky's views. He considers that Meirowsky's pigment from a pyrenoid substance was a fat and not a melanin pigment, but apparently (S. 84) allows that the Finsen rays will produce melanin pigment in the cytoplasm. Meirowsky ("Kritisches zur Melaninfrage," *Virchows Archiv*, Bd. 199, S. 561—6) replies to Jäger, maintaining the albumenoid as opposed to the fatty nature of his pyrenoid substance. A rejoinder by Jäger will be found on S. 567—70 of the same volume of the *Archiv*.

P. 188. Several cases of leucoderma have been treated by Dr Sequeira with Finsen light, but he was not able to effect any *macroscopic* change in the defect of pigment.

P. 200. A further case of recovery of pigment in leucoderma has been reported by E. Roberts ("Notes on a Case of Vitiligo," *Journal of Ceylon Branch of British Medical Association*, Vol. II. pp. 39, 40, Colombo, 1905). The patient was a Singhalese girl of 17 years, who lived at Moratuwa. A maternal uncle suffered also from the same disease. In this case the ears were white, there were broad white rings round the eyes, lower lip reddish white, and white patches on head, trunk and limbs; the forearms and hands from the elbows downwards were quite white and the legs and feet were very nearly in the same condition. The hair on leucotic patches was black. After 14 months the girl was so restored, that she became marriageable, and she is now the mother of several children, and only a few isolated leucotic patches are left. The author attributes the change to special treatment which he describes at length; he believes the disease to be associated with dyspepsia. Two illustrations show the marked restoration of pigment.

ALBINISM IN MAN

A MONOGRAPH

BY KARL PEARSON, E. NETTLESHIP AND C. H. USHER.

CHAPTER I.

INTRODUCTORY.

THE object of the present memoir is to give some account of Albinism in Man. Its scope is not only historical and bibliographical; we wish further to put before the reader a considerable mass of new material which has been directly collected for the purposes of this inquiry and which is, we believe, more ample than any yet provided. It allows for the first time of statistical conclusions being drawn as to the nature and heredity of albinism. As far as we are aware no very full treatment of the subject has been undertaken since the classical memoirs of Cornaz¹, and these, while they provide very full references to the albinotic literature at his date, are now half a century old, and the new material then contained in them, while very full for the cases with which Cornaz dealt, is limited to but two or three stocks. A more numerous series of families has been considered by Arcoleo², but beyond the statement that the parents were in all cases normal, Arcoleo's memoir deals simply with the sibship³ of the albino, and leaves unconsidered the family history of albinism in other ascendants, descendants and collaterals, a history, which we have almost invariably discovered, where it has been possible to trace the stock with any degree of genealogical fulness. Beyond these memoirs sections occur in medical works dealing with the subject, but adding little to the scattered material published during the last 150 years in various scientific and other journals. This material has not, we believe, been hitherto collected and standardised. An attempt has been made to do this in the present work, but we lay minor stress on this part of our data, because the value of the published cases is very unequal, and the family history in many of them singularly incomplete. The reporters in most cases either had not the leisure or the inclination to pursue a lengthy enquiry of a genealogical character, and only those who have endeavoured to follow up with some completeness even a single pathological stock will grasp the amount of patience, correspondence and careful sifting required in a matter of this kind. It is a sense of the great labour involved in such inquiries which makes

¹ See Bibliography, Nos. 245, 249, 250, 256.

² Bibl. Nos. 315, 321.

³ Throughout this monograph, sibship will be the term used for a group of brothers and sisters, and siblings for its members, when no regard is paid to sex.

us especially grateful to those ophthalmic surgeons and medical men who have provided us in many cases with complete family histories. Their readiness to investigate, to answer further inquiries, to verify individual points and follow up faint clues has given peculiar value to much of the new material here published, and convinced the authors how widespread is the tendency in the medical profession to appreciate the importance to their own and other branches of science of the modern study of inheritance. Not less gratitude also do we bear to those normal and suffering members of albinotic stocks, who occasionally with some reluctance and pain have communicated to us for the sake of science facts which it would have been difficult to ascertain, or to ascertain with any certainty, from other channels. In such matters we can hardly hope for completeness or absolute accuracy; facts have often to be extracted from the very ignorant, or even in the case of cultured stocks from members who have hitherto felt no interest in family history. Again in the case of pathological defect there is always a tendency to minimise or screen the actual taint or correlated abnormalities. Thus even up to going to press we have found it needful to add to or correct some of our pedigrees. But such corrections affect as a rule minor points, and we have used all the means in our power by aid of duplicated inquiries, and indirect cross-examination to insure accuracy in our results. We cannot, of course, be certain that some slips and inaccuracies may not have survived; all we can assert is that the best that lay in our power has been done, and we have faith that the new material of our family histories is as complete and correct as it is possible at the present time for such a series to be, and that average statistical results drawn from it may be trusted with full confidence.

When we turn to published matter the weight we give must of course be proportioned to the authority of the writer, the date at which he wrote, and the object of his communication. Many, even fairly early, accounts are clearly written with knowledge and caution, of others this can hardly be asserted; but even in the best the desire to fully describe a rather noteworthy abnormality predominates over the curiosity as to a complete family record. A great deal of the earlier interest in albinism arose from the importation into Europe of albinotic negroes, and in such cases, as well as in the reported slave cases in America, but little could be actually ascertained as to family history. Even a good deal of the excitement their appearance produced was undoubtedly due to theological reasons, and the confirmation they were supposed to give to an original *white* parent for the whole human race¹. Further, in a great number of the early cases of so-called partial or pied albinism in negroes we find that the congenital condition is not carefully distinguished from acquired leucoderma. There is in addition not always certainty as to the complete absence of white blood.

¹ Adam and Eve being *a priori* assumed to be white; the white negro was looked upon as a reversion to ancestral stock, the occurrence of a black from white stock not being an occasional experience. It is curious to find a modern anthropologist (Bibl. No. 381) taking up the opposite view and asserting that the white races are, like albinos, an abnormality, and due to a pathological variation arising in central European swamps! See also Maupertuis, Bibl. No. 58, p. 115; P. de la Coudrinière, Bibl. No. 91, p. 403, and Demanet, Bibl. No. 71, T. II., p. 208.

We have accordingly thought it best to deal in separate sections, not only with the small and remarkable group of pied negroes, but also with our albinotic negro data.

Definition and Classification of Albinism. This leads us at once to the fundamental inquiry: How is albinism in man to be defined, and is the condition to be considered as a homogeneous and invariable state, or must we form several categories? The matter is one of much greater difficulty than appears at first sight. It might seem easy to define albinism as the complete congenital absence of pigment from all parts of the human body. But it would be extremely hard, perhaps impossible, to make use of such a definition in classification. It is practically impossible to test the *complete* absence of pigment from the eye without microscopic examination of sections of the iris, choroid and retina, and it may even be doubted whether the same remark does not apply to the hair. Thus we know of four modern¹ cases at least in which sections of an albinotic eye have been microscopically examined. The first of these cases is due to Manz². He states that the eye condition and hair colour were such that the woman, whose eyes were examined, must be classed as an albino. She had further red pupils and suffered from photophobia. There is small doubt that she would in any such investigation as the present have been classed as a complete albino, although a certain degree of pigmentation of the pigment epithelium was present. The tissue of the iris, choroid and ciliary body was absolutely devoid of pigment, and even the brown pigment of the epithelium was so scanty as to permit the nuclei to be seen, whilst in some parts uncoloured protoplasm could be seen between the granules of pigment.

In a second case³ one of our number (Nettleship) examined sections (made by Mr Kenneth Scott) of the sector of iris removed during extraction of cataract from an old gentleman (Pedigree, Fig. 2, Plate I) who was universally recognised as completely albinotic. "In this specimen not only the iris itself, but its posterior epithelium, so far as it is present, is absolutely devoid of any trace of pigment, and the nuclei of the cells are in consequence seen with the same ease as in any other colourless tissues." Here the albinism appears to have been complete, although we have only the evidence available from a small piece of iris; his hair was, and is said always to have been, as white as silver.

The two remaining cases are due to Usher, who obtained specimens from two

¹ There is also one case from the 18th century. Buzzi (Bibl. No. 95) dissected the eyes of an albino. The irides were colourless and pupils rose colour. Both eyes were entirely deprived of "the black membrane termed the uvea"; it did not exist either behind iris or under retina. One saw in the eye only an extremely thin choroid of a pale red tint, due to "vessels filled with discoloured blood." Specimens of skin from various parts of the body seemed deprived of "corps muqueux." Maceration showed them nowhere, not even on the sides of the abdomen, "where they are usually most abundant and most visible." Buzzi attributes the absence of colour in both skin and hair to this want of "corps muqueux." De Saussure notes the absence of the uvea in the Angora rabbit, when commenting on Buzzi (Bibl. No. 88). It may be doubtful, however, whether Buzzi would have been able to detect the pigment discovered by modern microscopic methods, and his statement as to the uvea is probably inexact.

² Bibl. No. 357.

³ Bibl. No. 543, p. 248, and Chapter on the Albinotic Eye for a fuller discussion.

albino old men, and the results are also described by Nettleship in his *Note on some Varieties of Albinism*¹. We read :

"One of these (B), *aet.* 67, died of heart failure a few weeks after a successful operation for cataract in June, 1905. His hair, eyebrows, and eyelashes were white as they had always been, and when light was thrown on the sclerotic a marked red reflex was returned through the pupil and through large areas of the iris, in fact he seemed to be completely albinotic. Yet on microscopic examination of sections of the iris and choroid Usher found a good deal of brown pigment in both layers of the epithelium on the back of the iris, though not enough to prevent the nuclei being well seen; also in that of the ciliary body, and some, but decidedly less, in the retinal pigment epithelium at the fundus. No trace of pigment could be found in the proper structure of the iris, ciliary body, and most anterior part of the choroid near the ora serrata; but there was a very scanty though quite evident brown pigmentation of some of the choroidal cells, especially of those of the supra-choroidea at the posterior part of the globe, and this was somewhat more marked near the yellow spot than elsewhere."

Now it will be clear from this account that there might be even much less pigment than Usher found in this case, and still a failure to attain to that *complete* albinism which the suggested definition requires. Indeed without the most searching microscopic examination, which in most cases could only take place after death, we could not be certain that the albinism, even for the eye alone, was complete. Such a definition it is impossible to adopt for the cases recorded as complete albinism in our family records². We doubt indeed whether any such searching definition has been applied in the case of most species of albinotic animals—an albinotic mouse is one with white hair and pink eyes—and a closer investigation has usually not been attempted. As indicated by Usher, an ophthalmoscopic investigation is in itself not sufficient to give evidence as to the completeness of the albinism³.

¹ Bibl. No. 543, p. 248. See for fuller details our Plate *a* and the Chapter on the Eye.

² Mr Jonathan Hutchinson writes (Bibl. No. 494): "In the human race we certainly have, what I do not think are ever observed in the lower animals, incomplete albinos in the sense that the pigment failure is universal, including the eye, but nowhere quite complete."

In the above statement as to *lower animals*, Mr Hutchinson must have forgotten an earlier note of his own in which he quotes several cases of complete and others of incomplete albinism in thrushes from Morris's *British Birds*, Vol. III. p. 63. See his paper, "Albinism as a family peculiarity," *Archives of Surgery*, Vol. IX. p. 285, 1898. As a matter of fact generally incomplete albinism can occur in mammals and birds, and will be discussed later. It might even be suggested that albinism is often incomplete when the result of "natural" crossings such as occur among wild animals and in human matings, but that it can be made complete by artificial breeding between albinotic parents.

³ The appearance of the albinotic fundus oculi is well known and depends upon the deficiency of pigment in the choroid and retinal epithelium; the result is that the white sclerotic, which in pigmented eyes is invisible, comes into view between the innumerable ramifications of the visible blood vessels of the choroid. In the region of the yellow spot at the posterior pole of the eye, the choroidal vessels are so extremely numerous and fine that no spaces can be seen under the magnifying power available with the ophthalmoscope, and this part of the fundus therefore usually appears of an almost uniform bright red even in completely albinotic eyes. These features are shown in Taf. IV. Fig. 28 of Jaeger's well-known *Ophthalmoscopischer Handatlas*, Wien, 1869, side by side with illustrations from blond and brown eyes.

In Usher's second case, described as an albino old man, whose eyes were typically albinotic and hair light, the sections of the iris showed a similar condition to those of the first case.

The above will, we think, be sufficient to indicate that the eye of an albino may present all the features of the typical albino, red pupils, characteristic iris, nystagmus and photophobia, and yet on microscopic examination show the presence of some pigment. No examination on the living would probably suffice to indicate its presence. Further, there are facts indicating that the pigmentation of the eye can increase with age, such cases having been noted for the eyes of albinos by Ascherson¹, Meyer², Usher³, and others⁴. Thus if we deal with the eyes alone we see that our test of complete albinism becomes as a rule impossible, and if applied at different periods of life might lead to different classifications. At the same time the change in the appearance of the eye may not be wholly due to the belated formation of pigment; as Manz has indicated, a thickening of the iris may also be a source of apparent change.

Turning to the hair (see our Chapter on the Albino Hair) we find that not only may the hair of visibly complete albinos show traces of pigmentation when examined microscopically, but that albinos, with characteristic eyes and skin, may show, and we might almost add generally do show, tinges of straw, yellow or even red towards the hair terminals. The yellow or red tinge of the hair is noted by most of those who have examined negro albinos, and probably occurs generally with albinos of dark races⁵. In such cases, as Dr Frédéric has discovered, the microscopic examination shows a typical pigmentation⁶. Something depends also in individual cases on the length the hair is allowed to grow. Even when long and yellowish towards the tips, the hair may be almost quite white near the roots; and in such cases, if it were kept habitually very short, it would be counted as quite white. Again there are well-recorded cases of the visibly "white" hair of the typical albino becoming with age yellowish or reddish. Thus we may note the case mentioned by Nettleship in which the hair "white" at birth became quite brown by the time puberty was reached⁷, and the case referred to by Usher of two middle-aged brothers whose hair originally white is now yellow, and pupils originally pink are now almost black⁸. In the less recent literature we have other illustrations of the same sort of changes⁹. Several such

Yet it is a noteworthy fact that in the case Jaeger used to represent the albinotic eye scattered "Pigmentpunkte" were, he states, distinctly evident in the neighbourhood of the *macula lutea*, and imparted to it a weak yellow-red colour. The nystagmus causes great difficulty in getting a good drawing of an albinotic fundus as Frost observes at p. 17 of *The Fundus Oculi with an Ophthalmoscopic Atlas* (Young J. Pentland, 1896). Guéniot and Broca (Bibl. Nos. 294, 295) consider the source of the pinkness observed in the albinotic iris.

¹ Bibl. No. 207.

² Bibl. No. 204.

³ Bibl. No. 543, p. 247.

⁴ Bibl. Nos. 285, 364, 365. The Abadie and Parenteau cases are probably of this character: see Bibl. No. 543.

⁵ See our sections on Albinos of Dark-skinned Races.

⁶ Bibl. No. 553.

⁷ Bibl. No. 543, p. 245.

⁸ See our Fig. 60 and Bibl. No. 543, p. 247.

⁹ Cornaz, Bibl. No. 256, p. 383; also two additional cases referred to by his reviewer, Bibl. No. 256 (1856), p. 289.

cases occur in our own material: see Figs. 120, 393, 445, 447 etc. We may cite the cases referred to by Graves¹:

"Last year Dr Ascherson informed me that he had seen a case of the after-development of the pigment of the eye in an albino boy three years old. This child had at its birth white hair and violet-coloured eyes with dark red pupils; at the end of the third year its hair was light brown, and its eyes were blue, but they had still in a remarkable degree, though less so than before, that restlessness peculiar to albinos. This was the only case I ever heard of except that communicated by Michaëlis in Blumenbach's *Medicinische Bibliothek*, Vol. III. p. 679, which, however, only rests on the uncertain authority of some peasants. Singularly enough," says Dr Graves, "I had soon the good fortune to meet with a similar case myself. In my younger days there were two children, a brother and a sister, living near me, who presented such striking symptoms of leucosis in their eyes, hair and skin, that they were recognised as albinos even by non-medical persons. My attention was lately drawn to them by an advertisement in the papers in which their name occurred; and I learned that the brother had become a tobacconist; but to my great astonishment, on going to see him, I found that his eyes had changed from violet to gray, and his hair from white to light brown, and that the susceptibility of the eyes to the light had greatly diminished."

There appears accordingly little doubt that in certain cases, the frequency of which has not yet been properly ascertained, because it connotes following the life history of individual albinos, the amount of pigmentation in both eyes and hair may change with growth. Further that the existence of small amounts of pigment, only detected microscopically in eyes or hair, is not infrequent in those who would be generally classified as "complete albinos."

When we turn to the skin, it is probable that a like state of affairs prevails, but it will be comparatively rarely that a complete examination can be made of the entire body. It is more possible in natives of other continents than our own, and in these cases it is very usual to find that the albinos of native races, both on the evidence of observers and of photographs, have a mottled or speckled condition of skin, which may be slight but is sometimes very conspicuous; it occurs wholly or markedly in adults: see our sections on the albinotic skin in dark races². It would certainly be of scientific value, if those who have the opportunity would make a careful inspection of the complete body surface of typical albinos, and if any pigmented patches, however small, are found the observation of any change in them would be of great interest.

Recent researches³ of Lawford, Nettleship and Stephenson have shown that albinism of the eye can exist without albinism of hair or skin, and it appears probable

¹ See Prichard, *The Natural History of Man*, 2nd Ed., 1845, p. 79 *et seq.*

² In this respect Fig. 41 (Flemming's Case) where a single black hair occurred, Fig. 57 (Usher's Case) with a coloured mole, Fig. 142 (Jameson Evan's Case) with a brown sector on the grey iris of an incomplete albino, and Fig. 10 (Usher's Case) with a single pigmented patch at the fundus of an albinotic eye are of special value.

³ Bibl. Nos. 412, 502, 531.

that albinism of the hair, either complete or partial, can exist without albinism of skin or eyes¹. Cases of "white" hair and skin, but neither defective sight, "pink eyes" nor nystagmus have been noted². Again, cases of pigmentless skin with pigmented hair and eyes appear to occur, although they are more likely to be remarked in natives than in Europeans³. Cases of partial albinism of the skin are difficult to distinguish from leucoderma, but when they are congenital and stationary it may be more proper to class them under albinism⁴.

It would, we think, be difficult, however desirable it might be, to take as definition of complete albinism the total absence of pigment in eyes, hair and skin. The test cannot be applied, and for practical purposes we are reduced to the non-visibility of pigment in the parts of hair and skin accessible and the characteristic eyes of the class, red pupils and red, violet or grey iris⁵, nystagmus, photophobia and defective sight. But this albinotic condition, which once seen is hardly again mistakeable, is not incompatible with the existence of scanty pigmentation in either hair or eyes evidenced on microscopic examination. Nor is it possible to look upon it as a unit character of any kind; it can exist alone in any one or two of the three features we have considered, and its intensity and extent in each one of these can vary considerably, and may possibly change with growth or age. The manner in which cases of incomplete albinism are associated with complete albinism in certain stocks renders it *a priori* difficult to conceive of albinism as a single unit character from the standpoint of inheritance, and for the purposes of this monograph no attempt has or could be made to define a complete albino as one devoid of pigment in eyes, hair and skin. A complete albino is for our present purposes one whose skin is of characteristic pallor or milky whiteness, whose hair is "white," tinged possibly with yellow or straw, and whose eyes have pink or red pupils, translucent irides⁶, with the usual accompaniments

¹ Bibl. No. 447.

² See Fig. 22.

³ See our section on Native Albinos.

⁴ See our Plates I, J and K. One of the present writers has also a colleague, who states that the condition in his case was congenital and is stationary. See the discussion in our Chapter on the Skin.

⁵ Manz (Bibl. No. 387) is strongly of opinion that *gray* is the proper description for the albinotic iris. "Betrachtet man nämlich eine solche Iris genau und in der Nähe, so ist dieselbe weder bläulich noch roth, sondern besonders in ihrem mittleren Theil grau, weissgrau oder gelblichgrau, anders als was man gewöhnlich ein graues Auge nennt. Ich halte diese Farbe für das Albinoauge für characterisch, und vor Allem für sehr verschieden von dem blauen Auge der Blonden. Der Unterschied liegt hier in der Pigmentirung der Uvea an der Rückseite der Iris, das Irisstroma ist bei beiden pigmentlos und kann die gleiche Dichtigkeit haben, allein schon das von dem Augenhintergrund zurückkehrende Licht ist durch das pigmentirte Retinalepithel modificirt und erzeugt, wie bekannt, durch Interferenz die blaue Farbe. Die Intensität dieser Farbe hängt dann wieder vom Irisgewebe, und den Grau der Pigmentirung der Uvea ab."

⁶ These irides will be red if seen by light transmitted from the back of the eye (choroid), white or pale gray, if seen chiefly by light reflected from their own surface; violet or some such colour if the eye be more or less shaded, and but little light be returned either from the back of the eye or from the surface of the iris. In this way we can reconcile the different terms used by various writers. Thus one observer describes the irides as red or reddish, another as rose or light violet, a third as gray or gray-violet. Maupertuis and Voltaire (Pedigree, Fig. 288) probably saw "two sides of the same shield," and the description of the latter as "aussi mauvais naturaliste que bon poète" on this account may well lack justification.

of defective vision, nystagmus and ametropia. Incomplete albinism involves all the cases in which these conditions are not completely present. It needs, however, considerable subdivision; and further we are not prepared to assert that there exists any absolutely rigid division between visibly tested complete albinism and incomplete or partial albinism. The transition from one to the other is more or less gradual, and hardly two albinos can be asserted to have in exactly the same measure the characteristic albino qualities.

Geoffroy Saint Hilaire¹ insisted, possibly for the first time, on the distinction between: (i) Perfect Albinism, (ii) Partial Albinism, and (iii) Imperfect Albinism. His description of perfect albinism is of considerable interest and may be cited here:

“La peau et tous les poils sont en effet d'un blanc de lait, quelquefois d'un blanc jaunâtre. L'iris et la choroïde sont de même que la peau, privées entièrement, *ou presque entièrement*, de matière colorante; aussi l'iris est-elle ordinairement rose au rouge, quelquefois aussi bleuâtre, d'une gris pâle, ou jaunâtre. La pupille elle-même au lieu de paraître noire, est d'un rouge éclatant, peu différent de la couleur du feu” (p. 300).

The words italicised are so marked by us in order to indicate that Saint Hilaire recognised that it was not possible to define perfect albinism as a state wholly devoid of pigment. He also realised that the appearance of the eyes in the class was not wholly unique. He even suspected that imperfect albinism was probably more frequent than had been allowed,—he considered that perfect albinism is most common because it strikes observers most and “observers are so careless.”

Now that we realise how skin, eyes or hair may alone show perfect albinism, Saint Hilaire's three classes seem insufficient for classification. We need not only to signify that the albinism is perfect or imperfect in any one of the three characters, skin, hair, eyes (with finer analysis even other things may be dealt with²), but we require to ascertain whether it applies to *all* three characters. We may have perfect albinism of the eyes accompanied by imperfect or even wholly absent albinism of the hair. When the albinism applies to all characters we shall speak of it as complete; otherwise it is incomplete. Further, one of the letters, *H*=hair, *E*=eyes, *S*=skin may be used after incomplete perfect albinism to mark the character or characters in which the albinism is perfect. Imperfect with regard to any character will mean that there is some defect from the full albinotic condition. The particular character in which this defect occurs may be marked by using a small letter instead of a capital. Thus complete imperfect albinism (*H, S, e*) would signify that the albinism was peculiar to all the characters, hair, skin and eyes, but that the eye had some defect from the full albinotic condition, for example, had some visible trace of pigment and little or no defect of sight.

Lastly, while the albinism may be perfect in all the characters, as far as it extends, it may be local. For example, portions only of the skin may be devoid of

¹ 1832, Bibl. No. 203.

² *E.g.* lungs, bronchial glands, suprarenals, and pigmented centres of the brain ought to be considered. It is conceivable that albinism of such or other organs may exist and be correlated in a hitherto unrecognised manner with pathological defects.

pigment¹; a localised portion of the hair only may be pure white²; it is conceivable, although we know at present of no such case, that one eye only might present the albinotic characters. Such cases will be spoken of as *Partial Albinism*. We shall mark the particular character for which the albinotic appearance is only partial by the presence of a bar over the small letter. Thus partial albinism (H, E, \bar{s}) would signify perfect albinism of hair and eyes, but a piebald skin, showing only local absence of pigment. In suggesting this classification of albinism which is rather more complete than that of Saint Hilaire, we are fully aware how liable to misinterpretation a classification of any kind may be. Such groupings are definite enough in theory, but in practice doubtful transitional cases are always occurring, and our experience leads us to believe that this is as often true in albinism as in other abnormal conditions. Albinism is not in our opinion a single narrowly-defined condition, which exists or does not exist in an individual. The frequency of the individual sub-classes, and the degree of intensity even within these sub-classes, are points which require very careful consideration; it is only comparatively recently that trained observers have turned their attention to the collection of these cases of incomplete and imperfect albinism.

In some human races there is normally enough pigment in hair, skin and irides to make any considerable deficiency very conspicuous, and the detection of the various grades of albinism easy. But in races that are normally very fair the difficulty in drawing the line between extreme blondness and albinism is much increased. Attention in this respect was drawn by Phoebus many years ago to the case of the Frisians, and Dr Meyerhof, now of Cairo, but belonging to Hanover, informs us that in East Friesland white hair, white skin and light blue irides, combined with good sight, is very common, and he speaks of this as "incomplete albinism." A somewhat similar remark may be made for some parts of Norway or even England, especially if the attention be confined to children; in many, though not in all, of these "white-haired" children, the hair turns to various shades of brown after puberty. In the present state of our knowledge, the one safe diagnostic test of albinism is furnished by the eyes. When visual acuity is full and the eyes steady opinions might differ as to the classification of a person with white hair and skin, especially if he belonged to a normally very fair race. But if the same person had defective vision and nystagmus, no one would hesitate to call him an albino, even though there might be enough pigment on the back of the iris and ciliary processes to prevent the pupil from being red; the assumption being that the pigment in the posterior part of the eye was so scanty as to be incompatible with normal sight.

The data collected in this monograph will illustrate how difficult it is at present to grade the various types of albinism and how relatively frequent imperfect and partial albinism is in what we may venture to term "albinotic stocks." Even in what we have classed as "complete perfect albinism" we are forced to admit

¹ See the section below on Partial Albinism (Piebalds).

² There are not infrequent cases on record, and the condition appears to be inherited. See our Figs. 491, 529.

graduations¹, shading down to what other observers might possibly term "complete imperfect albinism." Even in cases which probably ninety-nine competent observers out of the hundred would class as "complete perfect albinism," we must bear in mind the words of Saint Hilaire, "privées entièrement, ou *presque entièrement* de matière colorante," and recollect that *post mortem* microscopic examination can alone determine that total absence of pigmentation which some have taken as a definition of albinism in man. If such a definition be needful to test any special theory of inheritance, then it is, we think, clear that albinism in man cannot be used practically to test that theory².

¹ De Saussure (Bibl. No. 88) held that "cette maladie comme dans le crétinisme" has "des degrés différens," 1785. Manz (Bibl. No. 357, p. 150), referring to the omission of writers to record imperfect cases, remarks "doch haben gerade die hierzu gehörigen Fälle vielleicht eine ganz besondere phylogenetische Bedeutung."

² Frauenfeld* has suggested (with every reservation as to the difficulty of drawing rigid class differentiation and marked emphasis on possible physiological diversity of origin) the following classification of pigmentation defects and variations, which seems to us not without value and suggestiveness:

(1) *Leucochroism*. Complete albinism, marked by red pupils†. Can be propagated in mammals. Knowledge as to birds limited because albinos in the domesticated varieties are very rare.

(2) *Chlorochroism*. The marking remains unaltered, but the pigmentation is as a whole faint, pale, indistinct (= bleichsüchtiges Kleid). Usually accompanied by a weaker constitution (?). Frauenfeld draws attention to the fact that there is no rigid line between (1) and (2) except for the red pupils. The colouring can become so faint, that only the marking remains, and this can often be traced in the complete albino if the light incidence be sufficiently oblique. Even the red pupil frequently cannot be settled without like oblique illumination, and the case of man shows us that it is a relative term.

(3) *Geraiochroism*. Loss of pigment with age; white spots appear and sometimes extend with successive moults.

(4) *Climatochroism*. Change of pigment with climate, whether the change be in brightness, extent or intensity, whether it be total or peculiar to certain parts. *Lepus variabilis* is a member of this class, but Frauenfeld refers to cases of birds whose plumage was observed to grow whiter when caged.

(5) *Allochroism*. This heading covers, as Frauenfeld admits, imperfectly, a number of cases of abnormal pigmentation, whether found occasionally in wild life, or actually bred among the domesticated races—for example white, but not truly albinotic varieties. As sub-classes are mentioned:

(a) *Protochroism*. A greater and greater absence of the pencillings or markings, so that ultimately we reach the simple ground colour without any reduction in its intensity.

(b) *Parachroism*. Appearance of colours not peculiar to the normal individual in the markings or elsewhere.

(c) *Melanochroism* = Melanism, the rare occurrence of pure black in a normally non-black race.

(d) *Augochroism*. Frauenfeld includes under this head an appearance he has noted, rarely in birds, more often in insects. Their own peculiar, or a new colour spreads fairly extensively over their body covering, as a misty sheen, sometimes with almost a metallic gleam.

(e) *Synchroism*. We believe Frauenfeld understands by this term, the reduction to a single colour, other than the normal body colour or black (protochroism or melanochroism), usually in a normally variegated individual.

In the case of man leucochroism and geraiochroism of course appear; chlorochroism may possibly be compared with extreme blondism; climatochroism will probably be recorded when more careful observations

* See Bibl. No. 579^b.

† Frauenfeld considers that albinos are markedly weaker than normally pigmented individuals of the same race. Reliable data for ferrets, rabbits, rats and mice on this point however are at present wanting.

CHAPTER II.

EARLY NOTICES OF THE OCCURRENCE OF ALBINISM.

WHILE popular interest in albinism became very marked at the end of the eighteenth century, owing to the bringing to Europe of albinotic and pied negroes, we find a fairly frequent reference to it in the writings of the mediaeval travellers, and rather more sparse indications in early and late classical authors. We shall consider some of these in the present chapter.

One of the most persistent traditions we find throughout the history of the subject is the statement that there has existed somewhere at some time an albinotic tribe, race, or even nation. This assertion is so illusive and yet so undying that it is peculiarly tantalising to the scientist, who desires above all things to record the results in the case of man of crossing albino with albino. Sometimes the albino race is in Africa, *e.g.* in the Sudan, Loango or elsewhere; then it has existed in Albania, in Ceylon, in India. It is reported from Brazil, from the central American regions, and most recently in the "forest country back of Cape Cod" in New England. But when we turn to the reports of the more credible travellers the local race appears to consist in the greater or less frequency of isolated albinos, probably (as our own data show) existing largely in special stocks. Whether in certain places and at certain times there have been albino intermarriages—either of free individuals or between slaves as the caprice of chief or king—it is difficult to determine. Such marriages would almost certainly emphasise the albino frequency and would give rise to various traditions. Their importance to the inquirer would be enormous, but so far we have not been able to discover any reliable evidence for there now existing or there ever having existed a pure tribe or clan, much less a race, of human albinos.

Pliny, Mela and Ptolemy all refer to the Leucaethiopes, but they give no description of the people thus designated. Pliny in his Lib. v. cap. 8, *Hist. Natur.* writes: Interiori autem ambitu Africae ad meridiem versus superque Gaetulos, intervenientibus desertis, primi omnium Libyaegyptii, deinde Leucaethiopes habitant.

Pomponius Mela, *De situ orbis*, Lib. i. cap. 4, is somewhat more explicit: At super ea quae Libyco mari abluuntur, Libyes Aegypti sunt, et Leucoaethiopes, et natio frequens multiplexque Gaetuli. For Mela the Leucaethiopes appear to be between the Troglodytes and the Nile, scarcely in Western Africa.

Agathemenos retires again behind those convenient intervening deserts, and merely says that west of Egypt are situated among other nations the *Λευκαίθιοι*. *De geographia*, Lib. ii. cap. 5.

Ptolemy, *Geographiae*, Lib. iv. cap. 16 (ed. Nürnberg, 1535, p. 77) describes are made on the effect of climate on human hair and skin pigmentation. Allochromism appears in human piebalds, and probably the xanthous negro would most closely fit the idea in synchromism. As we shall see below, no trustworthy case of congenital melanism has been recorded in man. Protochromism and augochromism seem to have no application to him.

Libya and says: Et sub Ryssadio monte Leucaethiopes. To judge by the map of this work which accompanies the Nürnberg edition, the Mons Ryssadius was on the equator near the west coast of Africa.

Now it is quite possible that a relatively light race of negroes or "white Moors," struck the fancy of some early traveller and so obtained a footing in all the early geographical works. There is a great range of colour from *café au lait* to black in Africa, and there is absolutely no need to suppose the Leucaethiopes were albinotic. Not till the name is applied to the albinotic negroes, who appeared in the seventeenth century, do we find any reference to white hair or defective sight associated with this tribe or race of "white Moors."

On the other hand the Albanian tradition points much more definitely to the existence of definite albinotic individuals, though not necessarily to an albinotic race. Thus Pliny writes (*Hist. Nat.*, Lib. vii. cap. 2)¹: Idem (Isigonus Nicaeensis) in Albania gigni quosdam glauca oculorum acie, e pueritia statim canos, qui noctu plusquam interdiu cernant. Here briefly we have the eye colour, white hair and photophobia of albinos recognised.

Aulus Gellius, *Noctes Atticae*, Lib. ix. cap. 4, has the same tale slightly modified: In ultima quadam terra, quae Albania dicitur, gigni homines qui in pueritia canescunt, et plus cernunt oculis per noctem, quam inter diem.

Lastly Solinus says of the Albanians: Albo crine nascuntur, canitiem habent auspiciu capillorum; ergo capitis color genti nomen dedit: glauca oculis inest pupula; ideo nocte plus quam die cernunt. *Polyhistoria*, 1689, cap. 15, p. 25.

These three witnesses are not independent, but they suffice to show, far more markedly than the Leucaethiopic tradition, that albinism could hardly have been widely spread in Europe in early days, or its appearance in a certain district would scarcely have excited such considerable interest².

The tradition of the Leucaethiopes may, as we have seen, have arisen from the existence of a race of fair Moors. There is, as is well known, a great range of colour in the negro, especially towards the north of Africa. Pruner Bey (Bibl. No. 273, pp. 307—311) notes the great variation in the colour of the negro. Burton has remarked on the same phenomenon, especially on coffee-coloured negroes (Bibl.

¹ Eble gives Lib. viii. cap. 2, which reference has been followed by later writers, e.g. Lagleyze (Bibl. No. 552, pp. 63, 111). There is nothing, however, bearing on albinism there.

² The name "Albanian" in connection with albino occurs in English use in 1632. Bostock (Bibl. No. 209, p. 87) quotes an epitaph on an albino child from the church of Worsborough in Yorkshire—Thomas, son of Ric. Elmhurst by Margaret his wife, daughter of Ric. Micklethwaite, whose promising parts were interrupted by an early death,....."This boy no Albian was, yet gray-haired borne, Who saw old age and night as soon as morne," etc....It is just conceivable that the classical tradition of the "Albian" led the Portuguese to the adoption of the word *albino*. Holland, the English translator of Pliny's *History* (London, 1635), speaks in his index to Vol. i. of "Albanes, peopled eied like owles, alwaies gray headed, and see better by night than day," and he translates: "That in Albanie there be a sort of people borne with eies like owles, whereof the sight is fire red: who from their childhood are grey headed, and can see better by night than day." What justification he had for this version we do not know, but he has made the "Albanes" very close to the albinos, a type with which he, as a doctor of medicine, was probably familiar.

No. 293, p. 56). Collignon (Bibl. No. 449, p. 725) notes the existence of negroes relatively white in the region of the Congo. It may not therefore be mere misinterpretation of words, but an indication of a physiological fact when we find considerable evidence of true albinism in the negroes of not widely removed districts. Thus Isaacus Vossius (Bibl. No. 29, pp. 67—69, *De Leucoaethiopibus ultra Nili fontes versus Austrum habitantibus*) in 1666 gives an exceedingly interesting account of the albinotic knowledge of his time, tacking on true albinism to the tradition of the albinotic race, and to the African districts where albinism seemed to be more or less endemic¹. Clearly we see in Vossius the “white Moor” race disappearing² before a clearer conception of the true albino, but we may possibly see also a clue to the tradition of the ancients.

Ludolf, writing 30 years later (*Hist. Aethiop. Comment.*, Franc. 1691, Lib. i. cap. 14, p. 197), refers again to the albinos at the court of the King of Loango, and attributes the first use of the term *albino* to Tellez (see Bibl. No. 27). Another reference we have found to the Loango cases is in De la Croix (*Relation de l'Afrique*, Lyon, 1688, Par. iii., liv. sect. ii., § 13). He says that other negroes avoid albinos as monsters³, but that they form a considerable body of attendants at the court of the

¹ The passage deserves quotation in full: *Albos vero Aethiopes, sive Leucoaethiopes, uti a veteribus vocantur, non tantum in praedictis regnis ultra Nili fontes austrum versus sitis, sed et passim in mediterraneis Africae reperiri tam est certum, quam quod certissimum. Magna pars satellitii Regis Louangi constat ex hujusmodi hominibus. Tanto candore sunt conspicui, ut siquis eos eminus videat, aut Belgas aut Germanos existimet, utpote qui praeter caesios oculos, etiam rufos aut flavos habeant capillos. At vero si quis coram contempletur, longe aliter sentiet. Iste quippe cutis candor, non est vividus, sed cadaverosus omnino et prorsus simillimus lepra laborantibus. Oculi quoque prope spectati, videbuntur similes oculis morientium aut straborum. Quamvis vero istud hominum genus e nigris quoque proveniat parentibus, constat tamen in mediterraneis Guineae etiam integram gentem istiusmodi Leucoaethiopum reperiri. Horum et habitum et contactum velut contagiosum, fugiunt alii Aethiopes. Unde, ut puto, colligi potest, vere esse leprosos, et etiam coloris discrepantiam ab aliis Aethiopibus induci a morbo, quod nempe cutis eorum exaruerit. Creber autem sic affectus apud Aethiopas, illos praesertim qui in aridis et aestuosis habitant locis, qui nisi perpetua et quotidiana unctione autem reficerent, omnes forsitan eodem laborarent. Hinc nullus apud Nigritas dies transit sine unctione, nec tantum oleo sed etiam adipe et quavis alia pinguedine totos se imbuunt, donec speculi instar niteant; et hac ratione non tantum cutem arescentem restituunt, sed et sanitatem et nigritiem, quae est pulchritudo Aethiopum, corpori suo conciliant. Istud admiratione dignissimum, homines istos interdum caecutire, noctu vero non plurimum visu valere, Luna praesertim fulgente. Itaque Nigritiae et Aethiopes horum inimici interdum, cum Sol maxime splendet, illos aggrediuntur; ipsi vero illatas injurias noctu ulciscuntur ac alios invadunt Aethiopas, magna saepe afficiunt clade. Istos Leucoaethiopas Lusitani vocant *Albinos* et aliquando nonnullos ex his bello captos et in Brasiliam abductos pistrino addicere tentavere, cum praecipuo valeant robore; sed compertum est illos mori malle quam servitutis pati vincula. Porro non in Africa sola, sed et apud Indos Orientales in Insula Borneo et praeterea in Nova Guinea, quae vocatur terra de Papos, simile hominum genus observare et nostri et Lusitani.*

The interest of this passage lies in the transition from the traditional race to the idea of albinism as an endemic disease. The supposed connection with leprosy recurs again much later, *e.g.* Sprengel, 1801.

² Buffon appears to have been ready to reaccept the tradition (Bibl. No. 81, Bd. xiv. Supplement), so also Haller (Bibl. No. 64).

³ The dislike of the negro for the albino has been very marked. Thus Olaudah Equiano, the African, writing in 1789 (Bibl. No. 110, p. 21), says: “Deformity is indeed unknown among us, I mean that of shape. Numbers of the natives of Eboe now in London might be brought in support of this assertion;

King of Loango. This is probably due to Vossius, or they take from the same source. Bowditch, 150 years after Vossius (*Mission to Ashantee*, London, 1819, p. 292), found nearly one hundred negroes of different colours through shades of red and copper to white at the King of Ashantee's court. They were generally diseased and emaciated. There can be little doubt that some of these were albinotic negroes. From court-follower to king is an easy-stage, and Valentyn, 1724, in his account of Amboina (Bibl. No. 49, p. 146) reports a king of Hetoe and his brother who were albinos, but who had black brothers and sisters and black children. Thus by a slight transition we find the despised albino has reached posts of honour! It is an illustration of a fact familiar to the anthropologist.

Much later than Bowditch we find Schweinfurth, 1868—71 (*Heart of Africa*, trans. by E. Freuer, Vol. II. chap. xv. pp. 100—101), noting the red, yellow and *chocolat au lait* colours of African negroes. He then adds:

"But there is one special characteristic that is quite peculiar to the Monbuttos. To judge from the hundreds who paid visits of curiosity to my tent, and from the thousands whom I saw during my three weeks' sojourn with Munza, I should say that at least five per cent. of the population have light hair. This was always of the closely-frizzled quality of the negro type, and was always associated with the lightest skins I had seen since leaving lower Egypt. Its colour was by no means like that which is termed light hair amongst ourselves, but was of a mongrel tint mixed with grey, suggesting the comparison to hemp. All the individuals who had this light hair and complexion had a sickly expression about the eyes and presented many signs of pronounced albinism; they recalled a description given by Isaac Vossius in his book upon the origin (*sic!*) of the Nile, of the white men he saw at the court of the King of Loango; he says that 'they were sickly-looking and wan of countenance and their eyes drawn as though they were squinting.' I have given a similar description of one of the King's sons named Bunza. This combination of light hair and skin gives the Monbutto a position distinct from all the nations of the northern part of Africa, with the single exception of the various inhabitants of Morocco, amongst whom fair-haired individuals are far from uncommon."

Schweinfurth's account of Bunza occurs in chap. XIV. p. 7, and is as follows:

"Many as were the visitors that I received in my tent, none awakened greater interest than one of the sons of Munza. The name of this distinguished personage was Bunza, and he was about the lightest-skinned individual that I had here beheld. His complexion could not have been fairer if he had been a denizen of Central Egypt. His hair was equally pale and grizzly, his tall chignon being not unlike a bundle of hemp and standing in marked contrast to the black tresses which were stretched

for in regard to complexion, ideas of beauty are wholly relative. I remember while in Africa to have seen three negro children, who were tawny, and another quite white, who were universally regarded by myself and the natives in general, as far as related to their complexions, as deformed." Precisely the same strong feeling existed among the Hindoos. Dubois (Bibl. No. 159, pp. 199 *et seq.*) says that the Indians considered them as lepers from birth, and their bodies were not buried but cast on dunghills. Further cases of strong racial aversion to albinos will be noted later.

across his brow. As the hair about the temples does not grow sufficiently long for the purpose, the Monbutto are accustomed to use false hair; and as fair heads of hair are somewhat uncommon, false hair to match the original is difficult to purchase. This young man, of whom I was successful in taking a deliberate sketch, exhibited all the characteristics of pronounced albinism, and in truth to a degree which can often be seen in a fair individual of the true Semitic stock, either Jew or Arabian¹. The eyes seemed painfully affected by light and had a constant objectless leer; the head, supported on a shrivelled neck, kept nodding with an involuntary movement, and whenever it rested it was sure to be in some extraordinary position. Bunza reminded me very vividly of some white twins which I once saw on the Red Sea; they were fishermen of Djedda, and looked as like each other as eggs in one nest."

We can, I think, conclude from the statements of Pliny down to those of modern travellers that there are districts in Africa where albinism has been very prevalent, and it would seem that these districts are those in which the normal negro shows lighter variation. There is little doubt that this is the only basis for the tradition of an albino race of negroes.

As we have indicated, India as well as Africa has been associated with the tradition of an albino race. The first reference occurs we believe in the fragments of Ctesias, who was physician to Artaxerxes and lived about 401 B.C. He speaks of two women and five men who were apparently albinos².

A more definite tradition appears in the "dog-headed" folk of Ctesias. Photius (*Myriobiblon*, ed. 1653, p. 151): Vocari hos ab Indis *Calystrios*, quod Graeci dicerent *κυνοκεφάλες*, id est *Canicipites* [carnibus eosdem vesci crudis], totiusque gentis capita numerari ad centum & viginti millia.

The transition of a congenital white-haired race into the marvellous dog-headed people of the mediaeval history books is one of the quaint bypaths associated with albinism and is treated of below. The tradition, however, of a white race, be it in Ceylon or Batavia, revives with the post-mediaeval age of discovery. In the *Voyage et Aventures de François Leguat*, London, 1708, the author says in the account of his voyage of 1693, T. II. p. 136: "J'ai beaucoup de regret d'avoir oublié de m'informer particulièrement de la Nation qu'on appelle *Chacrelats*, à Batavia, & dont j'ai vu plusieurs tant Hommes que Femmes. Ils sont blancs & blonds; mais ce qu'il y a de plus particulier en eux, c'est que leurs yeux ne peuvent pas supporter le grand jour, & qu'au contraire, ils voyent fort bien la nuit. Aussi font-ils de la nuit le jour & du jour la nuit. J'en ai souvent rencontré qui alloient les yeux baissés & presque fermés quoi que vers le soir; ne pouvant souffrir ce qu'il y avoit de lumière." Here we have a good instance of the manner in which the reduced discomfort of seeing in a less

¹ This is interesting as showing that Schweinfurth had seen Arabian as well as Jewish albinos.

² *Herodoti et Ctesiae Opera et Fragmenta*, Borheck, Lemgoviae, 1781, Vol. II. p. 874. The passage runs: ὁ δὲ ἥλιος ἀνίσχων τὸ ἥμισυ τῆς ἡμέρας ψῦχος ποιεῖ τὸ δ' ἄλλο, λίαν ἀλεινὸν ἐν τοῖς πλείστοις τῶν τῆς Ἰνδικῆς τόπων. ὅτι Ἴνδοι οὐχ ὑπὸ τοῦ ἡλίου εἰσὶ μέλανες ἀλλὰ φύσει. εἶναι γάρ φησιν ἐν αὐτοῖς καὶ ἄνδρας καὶ γυναῖκας λευκοτάτους πάντων, εἰ καὶ ἐπ' ἔλαττον. ἰδεῖν δὲ καὶ αὐτὸν τοιαύτας Ἰνδας δύο γυναῖκας καὶ πέντε ἄνδρας.

strong light is made the basis of a myth that the albino sees well by night, and even better than the normal individual. The passage is of interest also as an early instance of the use of *chacrelat* to describe albino.

The albino race of Ceylon is referred to by Ribeyro¹ (*Hist. de Ceylon*, Tréve, 1701, ch. xxiv.). He writes (p. 178) of the Bedas: "Ils sont blancs comme des européens, et il y a même des roux parmi eux." Again we touch on truth, for the red hair is a common feature of the albino of dark race, and not unknown in the European albino². The Bedas of Ceylon as an albino race are frequently referred to³, and perhaps not finally dismissed until 1807, when Cordiner in his *Description of Ceylon*, Vol. I. ch. 4, gives evidence against any such race. Probably Beda = Veddah, and there is confusion with the aboriginal race of Ceylon. As usual there may be a basis to the tradition in a fairer, perhaps light copper-coloured race, and the appearance of albinos in such a race, perhaps as a result of segregation following the crossing with other races⁴. It is worth bearing in mind that these traditions of an albinotic race appear to arise where there is a district with considerable variation in the intensity of the native colour, and further that in such districts albinism appears to be more frequent. The suggestion occurs that albinism may originate where we find a racial mixture, one or both races not being necessarily extremely fair; the leucosis would be a segregation effect bringing out latent characters. Humboldt⁵ remarks that missionaries seeing an Indian less black than usual call them white, and Prichard⁶ has also emphasised this attitude. A lighter race with a sprinkling of albinos leads easily to an albino nation myth. It is easy to dismiss such myths, but it is possible that there is a real basis to them; they may lead us to centres where albinism is more or less endemic, and where closer study may be suggestive even for scientific purposes⁷. If we turn from the "albino race" traditions of Europe, Africa and Asia⁸, we might expect to find like tales in the American continent, but naturally they must be of later date.

In America we find the early travellers locating albino races in Brazil, the Isthmus of Darien and Mexico. The Darien albinotic race has a fairly long history. Raynal in his *Histoire philosophique et politique des établissemens...dans les deux*

¹ Distrust of this author will be increased in the mind of anyone who notices how much he has taken without acknowledgment from Knox: see Bibl. No. 35.

² See our Pedigrees, Figs. 1 and 230.

³ See Bibl. Nos. 59, 64, etc.

⁴ The Seras, a mysterious race with red hair and blue eyes, mentioned by the ambassadors from Ceylon in the time of Claudius I. and recorded by Pliny (*Nat. Hist.*, Lib. vi. xxiv.), could hardly be the Chinese. The passage is very vague, but no doubt contributed to the tradition of the light red-haired "Bedas."

⁵ *Personal Narrative*, London, 1814, Vol. III. p. 287 *et seq.*

⁶ *Cyclopaedia of Practical Medicine*, Art. *Temperament*, p. 163.

⁷ For further information as to the Ceylon tradition the reader is referred to Knox, *Account of Ceylon*, London, 1681, p. 61 (he does *not* make the Veddahs albinotic); Labillardière, *Relation de son Voyage*, t. II. pp. 141—2; Percival, *Account of Ceylon*, London, 1803, chap. 13.

⁸ It is noteworthy that these traditions have provided three names for the albinotic individual. Possibly albino from the Albanian, Dondo (and Leucaethiop) from the African, and Chacrelat with all its variations from the Asiatic.

Indes (T. III. p. 154, Edn. 1774), speaking of Vasco Nunez de Balboa going to Darien, writes: "Le pays lui offrit d'abord de ces petits hommes blancs dont on retrouve l'espèce en Afrique, & dans quelques isles de l'Asie. Ils sont couverts d'un duvet d'une blancheur éclatante. Ils n'ont point de chevaux. Ils ont la prunelle rouge. Ils ne voyent bien que la nuit. Ils sont foibles, & leur instinct paroît plus borné que celui des autres hommes." N. Robertson, *History of America*, Vol. II. 4th Edn., p. 68, speaks of the Darien albinos as a race. Cossigny (1760: see Bibl. No. 59), speaking to the French Academy of Sciences, states that a number of travellers have come across the race in "a district not far from Mexico." He describes it as a nation entirely of white men, white haired, who cannot endure broad daylight without great pain. We have not been able to follow up the tradition to its ultimate source, which would probably be found in the accounts of the early Spanish navigators.

A fairly truthful report¹ of the actual state of affairs at Darien is however given by Wafer, whose whole method of writing strikes us as very creditable and credible for the period. Wafer first took to the sea as a surgeon's boy in 1677 and visited Darien with Dampier in 1681. Wafer was perhaps the first "Naturalist" to go on an exploring ship. He seems to have had a very considerable power of observation, giving a long, and, for the age, reasonable account of birds, beasts, snakes, fish, etc. in a section of his work termed *On the Natural History of these Parts*. On p. 346 of his Description he speaks of the "White Indians" as follows:

There is one Complexion so singular among a Sort of People of this Country that I never saw nor heard of any like them in any Part of the World. The Account will seem strange; but any Privateers who have gone over the *Isthmus* must have seen them, and can attest the main of what I am going to relate, though few have had the Opportunity of so particular an Information about these People as I have had.

They are white, and there are of them of both Sexes; yet there are but few of them in Comparison of the Copper-colour'd, possibly but 1 to 2 or 300. They differ from the other *Indians* chiefly in Respect of Colour, though not in that only. Their Skins are not of such a White as those of fair People among *Europeans*, with some Tincture of a Blush or Sanguine Complexion; neither yet is their Complexion like that of our paler People, but 'tis rather a Milk-white, lighter than the Colour of any *Europeans*, and much like that of a white Horse.

For there is this further remarkable in them, that their Bodies are beset all over, more or less, with a fine short Milk-white Down, which adds to the Whiteness of their Skins: for they are not so thick-set with this Down, especially on the Cheeks and Forehead, but that the Skin appears distinct from it. The Men would probably have white Bristles for Beards, did not they prevent them by their Custom of plucking the young Beard up by the Roots continually: but for the Down all over their Bodies, they never try to get rid of it. Their Eye-brows are Milk-white also, and so is the Hair of their Heads, and very fine withal, about the Length of 6 or 8 Inches, and inclining to a Curl.

They are not so big as the other *Indians*; and what is yet more strange, their Eye-lids bend and open in an oblong Figure, pointing downward at the Corners, and forming an Arch or Figure of a Crescent with the Points downwards. From hence, and from their seeing so clear as they do in a Moon-shiny Night, we us'd to call them *Moon-ey'd*. For they see not very well in the Sun, poring in the clearest Day; their Eyes being but weak, and running with Water if the Sun shine towards them; so that in the Day-time they care not to go abroad, unless it be a cloudy dark Day. Besides, they are but a weak People in Comparison of the other, and not fit for Hunting or other laborious Exercise, nor do they delight in any such. But notwithstanding their being thus sluggish, and dull, and restive in the Day-time, yet when Moon-shiny Night's come, they are all Life and Activity, running abroad, and into the Woods, skipping about like Wild-Bucks; and running as fast by Moon-light, even in the Gloom and Shade of the Woods, as the other *Indians* by Day, being as nimble as they, tho' not so strong and lusty.

¹ *A New Voyage and Description of the Isthmus of America, giving an Account of the Author's Abode there.* By Lionel Wafer, 3rd Edn., London, 1729. *Collection of Voyages*, Vol. III. 8vo, pp. 261—463.

The Copper-colour'd *Indians* seem not to respect these so much as those of their own Complexion, looking on them as somewhat monstrous. They are not a distinct Race by themselves, but now and then one is bred of a Copper-coloured Father and Mother; and I have seen a Child of less than a Year old of this Sort. Some would be apt to suspect they might be the Offspring of some *European* Father: But besides that the *Europeans* come little here, and have little Commerce with the *Indian*-Women when they do come, these white People are as different from the *Europeans* in some Respects, as from the Copper-colour'd *Indians* in others. And besides, where an *European* lies with an *Indian*-Woman, the Child is always a *Mostese*, or Tawney, as is well known to all who have been in the *West Indies*; where there are *Mostesa's*, *Mullatto's* of several gradations between the White, and the Black or Copper-colour'd according as the Parents are; even to Decomponents, as a *Mullatto-Fina*, the Child of a *Mullatto*-Man, and a *Mostesa* woman, &c.

But neither is the Child of a Man and Woman of these white *Indians*, white like the Parents, but Copper-colour'd as their Parents were. For so *Lacenta* told me, and gave me this as his Conjecture how these came to be white, that 'twas through the Force of the Mother's Imagination, looking on the Moon at the Time of the Conception; but this I leave others to judge of. He told me withal, that they were but short-liv'd.

We venture to think that in the Isthmus of Darien we have again a case of numerous albinos appearing on the borders of two races, and a possible instance of segregative effect. Wafer's account is so transparently honest that we might even venture to believe that, for man, albino mated with albino will not invariably give albinotic offspring. Close on either side of the Isthmus of Darien we find other traditions of albinotic races, the one from Brazil and the second from Mexico.

Schreber, 1775 (*Die Säugethiere*, Bd. i. § 14), has been quoted as authority for the existence of an albino race in Brazil. As a matter of fact he merely refers to Margrave's "red" Brazilian negress from an unknown part of Africa (see Bibl. No. 25). Robertson, 1778 (*History of America*, T. II. p. 405), cites de Pinto for Brazilian Indian albinos. Quite recently (1872) some notes of the traveller Porte with regard to the journeys he had made in South America and the albinos he had seen on the Amazon were published, and the reporter remarks¹: "Notre voyageur rapproche de ces albinos isolés ceux que l'on dit frapper des populations entières de l'Amérique du Sud, mais il ne paraît pas en avoir vu plus que les explorateurs qui l'ont précédé dans cette voie. Il se borne à dire, en effet, qu'on lui 'assure que les sauvages du Pacuja (rive gauche de l'Amazone, au-dessous du Rio Muja) étaient presque blancs et avaient les yeux bleus.'"

Thus this tradition has survived almost to the present day, and it again appears to be of the same type, *i.e.* a certain individual frequency of albinism among a people lighter than the surrounding population.

In the next place we may refer to the Mexican tradition. The source of this is better known. We find it in the account given by Cortez of his conquest of Mexico. In describing Montezuma's palace he writes: "In hujus palatii particula tenebat homines, pueros, feminasque a nativitate candidos in facie, corpore, capillis, superciliis, et palpebris²." Some further accounts of this strange entourage are probably to be found in contemporary Spanish records; it created some excitement and was discredited at the time. We have, however, not succeeded in finding them.

It is a curious phase of human development that this somewhat weird royal

¹ Bibl. No. 327, p. 160.

² *De Insulis nuper invent. Narratio*. Cologne, 1532, p. 30. See Bibl. No. 14.

accompaniment of albinos should be reported of such distant and independent kingdoms as those of Loango, Java and Mexico¹.

Another case of a white Indian tribe, which bears some marked albinotic features, is that described by Catlin, 1841 (*North American Indians*, Vol. i. pp. 93—4): "A stranger in the Mandan village [situated on Upper Missouri, lat. about 47° 50' N., long. about 23° W. of Washington] with the different shades of complexion and various colours of hair which he sees in a crowd about him; and is at once almost disposed to exclaim that 'these are not Indians.'—There are a great many of these people whose complexions appear as light as half-breeds: and amongst the women there are many whose skins are almost white, with the most pleasing symmetry and proportion of features; with hazel, with grey, and with blue eyes....Why this diversity of complexion I cannot tell, nor can they themselves account for it. Their traditions, as far as I have yet learned them, afford no information of their having had any knowledge of white men before the visit of Lewis and Clarke, made to their village 33 years ago. Since that time there have been very few visits of white men to this place, and surely not enough to have changed the complexions and the customs of a nation...."

After noting that all varieties except red or auburn of European hair may be seen, Catlin continues: "And there is yet one more strange and unaccountable peculiarity, which can probably be seen nowhere else on earth; nor on any rational grounds accounted for,—other than it is a freak or order of Nature, for which she has not seen fit to assign a reason. There are very many of both sexes and of every age, from infancy to manhood and old age, with hair a bright silvery grey, and in some instances almost perfectly white. This singular and eccentric appearance is much oftener seen among the women than it is with the men; for many of the latter who have it seem ashamed of it and artfully conceal it by filling their hair with glue and black and red earth. The women, on the other hand, seem proud of it and display it often in an almost incredible profusion, which spreads over their shoulders and falls as low as the knee. I have ascertained, on a careful inquiry, that about one in ten or twelve of the whole tribe are what the French call 'chevaux gris' or grey hairs; and this strange and unaccountable phenomenon is not the result of disease or habit, but that it is unquestionably a hereditary character which runs in families and indicates no inequality in disposition or intellect. And by passing this hair through my hands, as I often have, I have found it uniformly to be as coarse and harsh as a horse's mane; differing materially from the hair of other colours, which amongst the Mandans, is generally as fine and as soft as silk. The reader will at once see by the above facts that there is enough on the faces and heads of this people to stamp them peculiar,—when he meets them in the heart of the almost boundless wilderness presenting such diversities of colour in the complexion and hair; when he knows from what he has seen, and what he has read, that all other primitive tribes known in America are dark copper colour, with jet black hair."

¹ It will be shown in the following Chapter that Arizona and Mexico appear to contribute most albino Indians at the present time.

It may be well to note that Poole also reports light-haired and fair Indians from British Columbia and especially from Queen Charlotte's Islands (*Queen Charlotte's Islands, etc.*, London, 1872, p. 315).

Now Catlin had no apparent knowledge of the albino traditions and therefore his evidence is still more noteworthy. He thus gives us still another case of a fair tribe arising amid a dark population and providing in this case 8 per cent. of partial if not perfect albinos—he tells us nothing of the eyes of these white-haired individuals. Such material as he saw appears quite sufficient to have started in another locality the Mexican or Brazilian traditions, or in another continent the tale of the Leuc-aethiopes. It is another instance of the apparently isolated appearance of a fair group among a dark-complexioned race, and the contemporaneous frequency of albinos.

Beside the cases cited above there is a passage in Tachard also referring to a white group in the midst of a dark population somewhere on the east coast of Africa. It is not obviously albinotic, although it has been supposed to be. He writes (*Voyages de Siam des Pères Jesuites*, Paris, 1687, Book I. pp. 90—2), starting from the Cape of Good Hope: "Mais quand on fut arrivé au vingt-septième degré de latitude à dix ou douze lieues des côtes de l'Océan, on rencontra une Nation fort nombreuse et beaucoup plus traitable que toutes celles qu'on avoit trouvé jusqu'alors.... Les hommes sont bien proportionnez et robustes; ils ont de grands cheveux, qu'ils laissent flotter sur les épaules.... Parmi eux il s'en trouve d'aussi blancs que les Européens; mais ils se noircissent avec de la graisse et de la poudre d'une certaine pierre noire, dont ils se frottent le visage, et tout le corps.... Leurs femmes sont naturellement fort blanches; mais afin de plaire à leurs maris ils se noircissent comme eux."

It may not be possible to identify the district now, but it is worthy of note that this was probably the source of the assurance which Cossigny in 1760 gave to the French Academy that: "à Madagascar il y avoit une nation de Nègres blancs, mais qui, avec les traits des Nègres, ont des cheveux pareils à ceux des Européens¹." And these Nègres blancs for Cossigny were albinos.

It is as well in this section to complete the reports we have been able to collect of albinotic tribes or groups. The most recent of these also comes to us from the land of four others, but concerns in this case a white population. A circumstantial article appeared in the English newspaper, the *Standard*, of September 13, 1904, purporting to give an account of an albino colony on the New England coast. These albinos were stated to intermarry, and the writer professed to have seen a family in which both parents were albinos. This pedigree is given as No. 307 of our Plate XXIX. It will be seen that, if correct, it would confirm the statement of Wafer, that the offspring of two human albinos are not necessarily all albinos. The report of this albino clan "living in the forest country," at the back of Cape Cod, did not stand alone. Another newspaper article appeared, stating that there really did exist an albino colony in Massachusetts and placing it in or near Freetown, with the same

¹ *Histoire de l'Académie Royale des Sciences*, Année M.DCCLX, Paris, 1766, p. 17.

tribal name as that given to them in the *Standard* article. Still later, in the *Boston Sunday Herald* (Dec. 15, 1907), appeared a portrait of Miss Annie Lee Ridgway, "Patron Saint of Boxwood City, who has made the Albino Colony a Religious Community." According to this account the albino colony inhabited the Boxwood district of Lakeville, and the settlement migrated thither from Cape Cod. By aid of religious services and mission work Miss Ridgway is said to have "cleared up one of the worst places in Massachusetts." Of course the existence of an intermarrying albino community would furnish data of enormous scientific value, and we have done our best to clear up these newspaper reports. Direct appeal to Miss Ridgway has produced no answer. Dr F. W. Marlow, Professor of Ophthalmology in the University of Syracuse, N.Y., in conjunction with Dr W. L. Faxon, of Middleborough, Mass., a man acquainted with the district, has sought in vain for the colony, but he has succeeded in obtaining the pedigree (Fig. 412) of an albino family of the same name as that given by the *Standard* correspondent, but the environment and individuals do not appear to be the same. Of the reformed albino colony occupying a whole district of the town of Lakeville, no definite information has yet come to hand. We have discovered the Town Clerk of Lakeville, who most courteously promised a history of Boxville, but, in conjunction with Dr Faxon, he has not been able to trace a single case of a family with both parents albinotic. There appears to be some basis to the report of albinism being present in the district, probably in the form of individual members of a few related families; scarcely, as asserted by the newspaper press, in the shape of an exclusively intermarrying albino community. But this statement and the indefinite manner in which it has been made and repeated may suffice to demonstrate that we, to-day, really are not very far advanced beyond the state of mind of Pliny when he stated "ad meridiem versus superque Gaetulos, intervenientibus desertis, primi omnium Libyaegyptii deinde Leucaethiopes habitant," somewhere "back of the forest country," inland from Cape Cod, lives the latest albino race!

Before we conclude this section we may briefly refer to two further early references to probable cases of albinism, as apart from albino tribes. Abdollatiph, born at Bagdad in 1161 and writing his history¹ between 1200 and 1203, tells us:

"Inter Naturae Lusus, est cur hunc maxime miremur; infantem scilicet eodem temporis intervallo, anno nonagesimo septimo, natum fuisse cum duobus capitibus; alium item infantem, quem quidem ego viderim, natum esse cum capillis albis; qui tamen adeo non referrent albedinem canitie, ut quadantenus vergerent ad colorem qui rufus esset." Thus from India to Egypt from 400 B.C. to 1200 A.D. we find the albino born and recorded as a wonder, yet much as we know him to-day.

Our other instance is the story of the negro King Hydaspes, who refused to own to his daughter Chariclea because of her white skin and light hair. The tale has been often referred to as if Heliodorus' work were history and not a romance². Now Heliodorus was a Christian bishop who wrote Greek romances with a moral purpose,

¹ *Historiae Aegypti Compendium*. Oxford, 1800, p. 279.

² Eble: see Bibl. No. 196, Bd. II. p. 312. Also Ambroise Paré, Bibl. No. 19.

but it is highly probable that he based his tale¹ on the occasional appearance of a white child to black parents. "Thou wert borne white, which colour is strange among the Ethiopians." Persina, the black queen, attributes Chariclea's colour to maternal impression², but many parents of albinos do this to the present day, and the baring of Chariclea's arm, showing the dark spots, might easily have its origin in a knowledge of the mottled state of the skin of many albinos of the dark races (see our Chapter on the Albino Skin).

We now turn to a last strange misinterpretation of albinism. It is singular that the man who has been described as the founder of modern biology should have perpetuated in its grossest form one of the most foolish mediaeval traditions as to albinism! To understand, if we can understand, what led Linnaeus to his absurd treatment of albinism and his classification of the albino as a separate species, intermediate between man and the apes, we have to bear in mind the following points:

(1) The old classical historians still retained some weight of authority. Pliny's statement as to the existence of a light, red-haired race not far from Ceylon had probably influenced Ribeyro, whose plagiarism from Knox³ shows that he reported much more than he had himself seen. Thus he writes (1685)⁴:

"Nothing will appear less credible than what is to be related of the Veddass.... They are a race of people differing in every respect from all others. They dwell on the seaside between two rivers one of which separates them from Jaffnapatam, the other from Trincomalee. Their country ten leagues long by eight broad is covered by thick forests. They dwell in recesses of the woods, and it is not easy to fall in with them. *They are as white as Europeans and many are ruddy complexioned.* They do not speak Singhalese; their language is dissimilar from any spoken in India. They have no trade or correspondence with other races, and flee hastily when they meet a person not one of themselves. They clothe themselves with the skin of the animals which they kill in the forests. They have neither villages nor houses, they lie six months in one place and six months in another, or as soon as the grain they have sown is reaped, they change their dwelling-place. Their weapons are bows and arrows with which they are very skilful; they live chiefly on game; kill wild boars, stags and elk of which the forests are full; do not cook their meat, but preserve it in honey; never eat their meat fresh, but keep it so preserved for 12 months. When they want hatchets, etc., they make models of them with branches of trees and carry them during the night to the door of an armourer's house and leave them there with some meat...the armourer makes the hatchet, etc., in the morning and hangs it up where the meat was. In the night time the Veddass come and fetch them."

Except for the passage about the *whiteness* of the Veddah race, italicised in our transcription, the account might pass for that of an aboriginal race. It is the basis of the widespread statement of the 18th century that albinos were termed Bedas in Ceylon.

¹ See Bibl. No. 22.

² See Bibl. No. 22 Bourdelotius, pp. 176, 478, 479, and Underdouné, pp. 107, 270—1.

³ See Bibl. No. 35 and our footnote 1, p. 16.

⁴ Bibl. No. 39, p. 78.

Olaus Magnus, 1555, after noting in his Liber II. Caput XVI., *De transitu tenebroso*, that people in the north carry rotten wood, or place it along a path to show light in the night, continues: "Inveniuntur etiam homines eo acumine oculorum praediti, ut sine quovis lumine materiali fere omnia videre, tractareque se posse gloriantur. Tales utique in Taprobana (teste Plinio) multo plures, quam alibi per orbem reperiuntur¹."

The above passage has been usually supposed to refer to the occurrence of albinos in Scandinavia. This is not necessary, but the words served to emphasise in later times the connection between Ceylon and the men who see by night. I have failed to discover any passage in Pliny's *Natural History*, where this property of the inhabitants of Taprobana is referred to. Lib. VII. cxxii. deals with the island and its inhabitants, but contains nothing about their sight, nor does the matter appear to be discussed by Salmasius in his *Exercitationes Plinianae*, Paris, 1629. Pliny does in his Lib. XI. cap. 37 deal with the eyes, and tells us of many things possibly touching albinism. He refers to night-blind folk and tells us of other men who see badly by day and better by night than other people. He reports that Tiberius Caesar, if awakened in the dark, could for a little while see everything as well as in clear daylight, but soon this visual power vanished. Augustus Caesar had glaucous eyes like to some horses, for the size of his eyes was much greater than that of other men. He refers even to squinting eyes, moving eyes² (? nystagmus), and to those who had very small eyes. All this, but not a word as to the albinos of Taprobana³! The idea, however, of a variety of mankind, a *Homo nocturnus*, which saw better at night and was peculiarly frequent, even forming a special race in Ceylon, grew with the centuries.

(2) We have next to give due weight to Photius' statement of the "canicipites" (see p. 15) who he said occur in India. On the one hand there is a tradition of "white hair" in the word, on the other of a dog-headed people eating raw flesh. Throughout the middle ages, however, these "canicipites" had been associated with "troglodytes" and other mysterious occupants of desert and forest. Pliny⁴ is usually appealed to as authority for the Indian "canicipites"; what he, Augustine and Isidore had recorded was accepted as truth by all mediaeval writers⁵. The mediaeval seaman went about in

¹ See Bibl. No. 13, p. 76. The italicised words do not occur in the Lugduni Batavorum Edition of 1645, Cap. XIV. p. 56, or in the English trans. of 1658, London, p. 23.

² See footnote, *Histoire naturelle de Plin*, Paris, 1772, T. IV. p. 364.

³ It is most characteristic of the age that Philemon Holland in translating Pliny's *History* in 1635 turns all this material as to eyes in the direction of albinism! Thus he writes: "August Caesar of famous memory had red eyes like to some horses; and indeed well eied he was, for the white thereof was much bigger than in other men" (p. 334). "Man alone is subject to the distortion and depraved motion of his eies. Hereof are some of the surnames of certain families in Rome, *Strabones* and *Paeti*: for that the first of those houses were squint-eied, and had rolling eies....As also them that were pink-eied and had very small eies, they termed *Ocellae*" (p. 335). There is no word of these red-eyed or pink-eyed persons in Pliny!

⁴ See Photius, *Myriobiblon* (Bibl. No. 10). He quotes Ctesias as to the *Canicipites* (p. 150). Agatharcides, cap. XXXVIII. (*Ibid.* p. 1362), places them in connection with the Troglodytes. The account in both cases might arise from reports as to either a manlike ape or a wild aboriginal race.

⁵ See *inter alia* the *Buch der Croniken*, Nürnberg, 1493, Blatt XII. and its illustrations.

the expectation of discovering "canicipites" and "troglodites," and he naturally told tales of them to suit the expectant landsman at home.

(3) The discovery of the anthropoid apes in the East Indies was the factor still needed to give a "reality" to the whole jumble of distorted ideas. The ape appeared as the veritable dog-headed man, and "canicipites" and "troglodites" were destined to leave their names for ever impressed on the Simian race.

Bontius (see Bibl. 26, p. 84) gives one of the earliest accounts of the ourang-outang, which name he says the Javanese give it because it is a man of the woods, *Homo sylvestris*. He says that the Javanese assert that it arises from the lust of the Indian women, who mix with the apes—a tale he does not appear to credit. He describes the rather human characteristics of the female, and figures her as a sort of hairy woman, not much resembling our idea of the ourang-outang. He identifies this *Homo sylvestris* or ourang-outang with Pliny's Satyr (*Nat. Hist. Lib. vii. cap. 2*). There is nothing about pigmentation or sight, but the whole tale, without apparently the least hesitation, was afterwards transferred to the albino (including the legend of being the hybrid of man and ape!). Bontius is not responsible. He gives a bad cut of an aboriginal or a beast he had probably never seen *close* at hand (see our Plate *η*); it remained for Linnaeus to identify this ourang-outang and the albino!

(4) Good examples of the travellers who start with a tradition and live up to it in what they see may be found in Nils Matsson Kjöping and Braad.

Kjöping¹, 1667, describes a visit to Tharnodo, one of the Moluccas. He writes about the albino as of a *Homo sylvestris* and *Homo nocturnus*:

"*About the peculiar Kind of People which is being destroyed like Vermin.* Here as well as in Amboina there is found a peculiar kind of people, which are called Kakurlacko, these are regarded as vermin and killed wherever they are found by the inhabitants; they are snow-white, both skin and hair, although the inhabitants are black, and they hide themselves in secret caves during the day, where no one can find them without great difficulty. During the day they are altogether blind, as if their eyes had been put out; for when they are dug out during the day, they creep about like young puppies before their eyes are opened. But during the night the darker it is, the better they can see; they occupy themselves with pilfering and theft, stealing by night all that the inhabitants have sown and planted; they also have their own language which they utter with a whistling sound; it in no way corresponds with the proper speech of the country². The captain of our ship asked the Tarnatanians to give one of these Kakurlacko to him, and a woman was given to him, who at first could eat no cooked food³, nor did she know in the least how to conduct herself for she could see nothing; but the more she got used to or was driven into the sun or daylight the better she could see, but she stepped very high with her feet."

¹ See Bibl. No. 30, Chapter LXXXVII.

² The whole tale should be compared with Pliny, *Nat. Hist. Lib. v. Cap. 8*, which links up our "Kakurlackos" with the Troglodytes: "Troglodytae specus excavant. Hae illis domus, victus serpentium carnes, stridorque, non vox: adeo sermonis commercio carent." Solinus writes: "Ignarique sermonis, strident potius, quam loquuntur."

Cf. the "carnibus eosdem vesci crudis" of the *Canicipites* of Photius, cited on our p. 15.

D. Braad, who is cited by Hoppus as having returned from his seventh journey to India, talks of our poor albinos as a species of dumb forest-dwelling thieves, who go about by night and expect eventually to assume the government of the world!

Not quite a hundred years after Bontius and Kjöping came Olaf von Dalin who in an oration before the Swedish Royal Academy of Sciences, 29 April, 1749 (*Weterhets-arbeten*, Vol. 2, Pt. 2, pp. 122—3, Stockholm, 1767), gave an account of a race of negroes from the middle of Africa with white skin and hair of the same colour but like wool, long ears¹, hanging eyebrows, round eyes with rose-coloured irides, bad sight, but seeing better in the dark than in the day; of small stature, and living only about 25 years. They believe themselves the chosen people for whom the world was created, and that the time will come when they will rule other races. Dalin gives no authority for his statements; he was a medical man and a poet.

In 1760 we have a paper by Hoppus for which Linnaeus is presumably responsible. It is published in the *Amoenitates Academicæ* (see Bibl. No. 113, pp. 72—6). It deals with the *Troglodyta* or *Homo nocturnus*. Pliny, Lib. v. cap. 8, is taken as a starting-point, and then we have a reference to the perfectly genuine albinos reported from Africa, Java, Amboina, etc., referred to in our chapter on Geographical Distribution. This is mixed up with travellers' tales of the wild aborigines and of the anthropoid apes. Hoppus concludes with the statement that the *Troglodyta*, or *Homo nocturnus*—by his account a sort of ape-albino—must be placed as *Anthropomorpha* somewhere between man and monkey but nearer to man!

Linnaeus in his *Systema Naturæ* set the seal on this farrago of nonsense. In the 12th Edn. of 1766 we find the opinion of Hoppus adopted. *Troglodytes*, *H. nocturnus*, *H. sylvestris*, Orang-outang, and Kakurlacko—Pliny, Kjöping, Bontius and Dalin—are combined and the harmless albino is identified with the anthropoid ape (p. 33). Not till twenty years later in the edition of 1788 (p. 26) does *Troglodytes* cease to be associated with *Homo nocturnus* and come under *Simia*, being then classed with *Satyrus indicus* and chimpanzee, and said to inhabit Angola².

Thus in the first great founder of modern biology we find the most complete

¹ Such long-eared folk are mentioned by Pliny and are figured in the Nürnberg Chronicle. Marsden in his *History of Sumatra*, London, 1733 (p. 308, footnote), writes: "The people of Neas are small in their persons; of a fair complexion, particularly the women who are mostly sent to Batavia; but a great proportion of both sexes are infected with a species of leprosy which covers their bodies with white scales; and their ears are made to extend in so preposterous a manner as to be often near touching their shoulders, which the purchasers of females sometimes get trimmed to the natural size." Was Pliny or Marsden the source of the long-eared albino myth?

² Huxley, *Essay on the Natural History of the Man-like Apes*, *Collected Essays*, Vol. VII. p. 17, says that Linnaeus knew nothing of his own observation of the man-like apes, but Hoppus may be supposed to embody his views. Huxley rather discredits Bontius, but the latter never asserted that his orang-outang was an ape, and as a matter of fact the name is not used by the Malays for an ape but for an uncultured tribe living in the woods and means "man of the woods" (see Miklucho Maklay, *Chambers' Encycl.*, 1906, Art. *Orang*). Bontius is fairly obscure in his brief account of the *Orang*; his figure (see our Plate η) according to Huxley (p. 11) is "nothing but a very hairy woman of rather comely aspect (!), and with proportions and feet wholly human," but Bontius' sin is nothing compared to that of Linnaeus who linked up *H. nocturnus* with all the absurdities of mediaeval travellers and post-classical writers.

phase of mediaeval tradition. An examination of our bibliography will convince the reader that even in 1766 Linnaeus could have learnt from quite a number of writers that the albino and the troglodyte were not to be confused. In the very year of the 12th edition of the *Systema* the Danish missionaries (see our Bibl. No. 70) were sending home quite reasonable accounts of the albino, and Duddell thirty years earlier (see our Bibl. No. 55) knew quite well that an albino was nothing sub-human.

Such, however, was the last quaint myth as to the albino, and it may fitly conclude our account of these early notices of albinism. We have endeavoured in this section to show the lengthy history of albinism, to indicate some of the quaint bye-paths of albinotic tradition, and indirectly to throw some light on the appearance of albinos and their treatment in widely separated lands. If we have seen that there is no real evidence for the existence of an albino race or nation, which could justify the statements of the early writers, or excuse Linnaeus for making a separate species of *Homo nocturnus*, the albino man, we still think that something is to be learnt from the oft-repeated tale. We find it almost invariably marks a group apparently racially differentiated in hair and eye-colour from the neighbouring races, and that the albinos arise in close association with this group,—possibly by some result of segregation. This may not be the only manner in which albinos appear, but we fancy a real census of albinos leading to a knowledge of the districts in which they are most frequent might be suggestive for many points turning on mutation and segregation. As it is we are, as we shall see in the next section, very far from knowing the relative frequency of albinism geographically, although we know that it occurs in almost all countries and suspect it of occurring in all.

CHAPTER III.

GEOGRAPHICAL DISTRIBUTION OF ALBINISM.

SECTION I. THE LIGHT-SKINNED RACES.

THIS chapter must necessarily fail of the completeness which we should desire for it. The occurrence of albinism, whether we take it to be 1 in 5000 or 1 in 30,000 of the population, is rare, a fraction of a percent., and the probable error of the determination of any such small frequency is very large. When we take a small district of which we can actually examine the whole population, the numbers dealt with are not sufficient to give any reliable result. In larger districts, where the occurrence of albinism may be so marked as to be sure of record, we are often, especially among non-European races, wholly ignorant of the number of the population. In large civilised communities the albino will often escape the notice of the individual inquirer, and some special type of census must be devised. This census may take the form of voluntary returns to schedules issued, as in the case of the survey made by the Italian Anthropological Society, and in the inquiries issued to the district medical officers in Norway by Dr Magnus, or it may be part of a more general scheme as when we organise a pigmentation survey of school-children (Prussia, Scotland, etc.). Unfortunately such pigmentation surveys have not so far adequately dealt with the problem of albinism. Nor have they hitherto included those special institutions, such as Blind-Schools and Schools for the mentally-defective into which a relatively large number of the small number of albino children appear to be drafted. Beyond this a considerable number of albino children are in the better classes kept from school and educated at home, or in the poorer classes are allowed several years of grace by the school-officer¹; this reduces the percentage of albinos to be found in the schools at any given time. Thus a school-district with 20 or 30,000 children may report at a given time not a single albino child in the schools, although we have had knowledge of one or two families with albino children living in the district; some of these are possibly in special institutions, others are owing to delicacy and poorness of sight kept from school.

Another point of some difficulty in an inquiry like our own, which extends over several years and is not a record taken at a single epoch, is the question of birth and death; albinos recorded as living five or six years ago may now be dead; we cannot hope by accumulating family histories to obtain the extent of the albinotic section of the population at any given time. The only way to achieve such knowledge would be to include albinism, like blindness, deafmutism and insanity, with the conditions which must be compulsorily returned in the national census. It is idle to disregard

¹ Statement made by several young adult albinos on inquiry as to nature of their school career.

the fact that, however many be the exceptions, albinism is very often associated with lowered physique and lessened mentality, and that from the standpoint of the efficiency of the population its present extent and possible increase is a matter of national importance¹. Till, however, the census is properly used as a method for determining the changes in the racial fitness of a population, the reader must be content with the vague returns as to albinism, which is all that it is possible for the individual inquirer to collect.

Even in such returns we may bear in mind some vital points, which if they cannot be fully dealt with at present, may yet receive some light from our inquiries. For example: Are there any countries or races where albinism is unknown, or at any rate very scarce? In a given country is there evidence to show that albinism occurs relatively more frequently in secluded districts, mountain valleys or islands, where we may suppose the population sedentary and much endogamy to prevail? To what extent does inbreeding in man, cousin or even closer marriage, seem to lead to albinism in the offspring? In any given population does relative purity of race, or the mixture of races, as indicated by differences in skin, hair and eye-colours, seem to favour the appearance of albinism? To these problems the reader may find some contributory suggestions, if far from complete answers, in the following pages.

A. *Europe.* (i) *Scandinavia.*

The only part of Scandinavia which we have been able effectively to report on is Norway. In the first draft of this chapter we wrote, owing to careful inquiries kindly made by Dr Grossmann of Liverpool, who had spent several holidays in Iceland, that the medical men there had never heard of an albino in the island. (Population about 76,000 in 1898.) But direct inquiry by one of our number of Dr Mathiasson led to the discovery of three living and one dead albino, which would give a minimum of at least 1 in about 25,000 inhabitants, a ratio not widely divergent from that noted in other parts of Europe (see Fig. 488). Probably any such complete census in the rural districts of Iceland as that made by Dr Magnus in Norway would lead to the discovery of further albinos.

Sweden has unfortunately remained an almost untrodden field. We can refer only to the case recorded by F. v. Becker in 1869. It was a single case of complete general albinism in a child of 13 months². We regret having no data from Sweden, because it has probably a more uniform population than Norway, and the relative frequency of albinism in these two Scandinavian countries would throw some light on the influence of purity of race on the prevalence of albinism. For Denmark our returns are as defective as for Sweden. We can only point to Rhode of Augustenburg's account of a Danish "Kackerlaken" from 1787³. This was a boy of 14, perfectly healthy and intelligent, small, nystagmus, photophobia, myopia, could hardly see a stick at 12 paces; pupil bright red, iris violet-red; snow-white lashes and brows;

¹ The birth certificate, as one of the present writers has elsewhere urged, ought to provide a record of every marked defect or deformity (*Biometrika*, Vol. v. p. 79). Nothing short of this will provide the nation with a means of determining the great problem of whether degeneracy is or is not on the increase.

² See Bibl. No. 316.

³ See Bibl. No. 104.

long straight white hair, nearing yellow. He is stated to have had albinotic ascendants or collaterals. Obviously a typical complete albino, like v. Becker's Swedish case. Again this absence of information is not to be taken as indicating any infrequency of albinism in Denmark.

C. H. Usher when in the Faroe Islands in the summer of 1906 inquired of all the six medical men there, and found that not one of them had ever seen an albino in the Faroes. (Population 17,000, and many of the people are very isolated.)

With regard to Greenland we may note here that with a population of nearly 10,000 Esquimaux a Danish official who had been there for 22 years and had personal knowledge of almost the whole of the inhabitants assured C. H. Usher in 1906 that he had never seen an albino amongst them.

With regard to Norway, owing to the labours of Dahl¹, Koren², and recently and most completely Magnus³, we are able to give far more complete data. The reader will find the following pedigrees deal with Norwegian cases, Figs. 147—9, 318, 319, 365—7, 453—82, 530, 556—61, 594, 608 and 612. Dr V. Magnus has himself provided the following special summary of his investigations. "Through an inquiry of all the local medical officers ('Distriktlaegen'; the official medical man for a district is not, however, exactly rendered by the English 'local medical officer') I obtained knowledge of 130 cases of albinism in Norway, and I have obtained the pedigrees of about 100 of these distributed into about 50 families. In the districts which have been fairly closely investigated there were at least 122 *living* albinos to a population of 1,177,150, that is about 1 to the 9 to 10,000 inhabitants. In the three chief towns, Kristiania with 232,000 inhabitants gave 10 living albinos, Bergen with 82,200 3 living albinos, Thronthjem with 42,000 only 1 living albino. But the difficulty of obtaining a complete census of these big towns is greater than in the country districts where the *Distriktlaege* has a more intimate knowledge of the population individually. Excluding the above three towns, 40 lesser towns with a population of 280,368 gave 39 living albinos, and the rural districts with a population of 484,000 gave 68 living albinos, in both cases the proportions are nearly 1 in 7000⁴, and there appears to be no greater frequency of albinism in the secluded valleys and fjords where there has been since ancient times much inbreeding than in the urban population. The distribution of the albinotic stocks is given by black circles on the map, Plate δ , and it will be seen to follow largely the population distribution. Of course the numbers are insufficient for any very definite result; they do not, however, confirm the view that mere inbreeding has anything to do with the appearance of albinism.

"The 122 living albinos have had 17 albinotic brothers and sisters. Altogether I have heard of 174 albinos in Norway, 20 of whom are dead. The actual percentages of male and female albinos and of normal and albino siblings in albinotic sibships will

¹ See Bibl. No. 276.

² See Bibl. No. 339.

³ Pedigrees published first in this monograph.

⁴ The size of the population falling to each *Distriktlaege* who replied to my inquiry has been most kindly provided by Dr Rasmus Hanssen, General Secretary of the *Norske Laegeforening*, of course in round numbers.

be discussed with other data in the chapter on statistics of this monograph. It may be added, however, here that of 17 albinos who have married normal individuals, only two have had albinotic offspring, in one case one albinotic child and in the other case two such children." See Pedigrees, Figs. 560 and 608.

(ii) *Lapland and Finland.* We have no returns¹.

(iii) *Slavonic Populations.* We have no data from the small Southern Slavonic states. Inquiries were made in Northern Russia by C. H. Usher. Staatsrath Dr med. L. v. Lingen kindly replied as follows under date St Petersburg, 19 Feb. 1909 :

"Auf die Bitte von Herrn John Kilburn habe ich bei einer Reihe von Aerzten in Petersburg Nachfrage angestellt, ob diese in ihrer Praxis auf Albinos gestossen sind. Die gefragten Collegen, denen ich mich auf Grund eines grossen Hospitalmaterials anschliessen kann, äusserten sich einstimmig darin, dass sie in Petersburg niemals auf Fälle von Albinos gestossen sind."

The Rev. W. Kilburn has most kindly made inquiries among the clergy of North Russia, and none had seen or heard of any case of albinism; indeed but for the typed inquiries he had with him many would have thought him mad to ask about such an unheard of condition.

We are justified possibly in concluding that albinism is very scarce among the Northern Slavs². It would be of much interest to know whether it is not more frequent in the Russian Baltic provinces³, where we again come on the borderland of two races. Such an inquiry, say round Memel, would be of special value, because as Virchow has already pointed out⁴ there is a minor form of albinism racially present among the Letts. They are a blond race with straight yellow hair⁵. Praetorius spoke of the Lettish eyes as "gray falling almost into yellow." Virchow found that this characteristic was associated with distinct anatomical peculiarities, which he describes as follows :

"Erstens fand sich bei der Mehrzahl der Leute eine eigenthümliche ungefärbte und daher weissliche erscheinende Deckschicht, welche in bald breiterer, bald schmälerer Ausbreitung den mittleren Theil des Iris-Ringes bedeckte und sowohl den pupillaren als den lateralen Rand frei liess. Ich habe diese Schicht als Reticulum oder Netzwerk bezeichnet, weil sie bei genauerer Betrachtung aus einem maschigen Gewebe bestand, dessen Faserzüge zu zahlreichen Knotenpunkten zusammentraten. Da, wo die Maschenräume lagen, schemmerte die meist blaue oder bläuliche tiefere Lage der Iris durch, während die Fäden und Netze selbst durch ihre Undurchsichtigkeit und

¹ The *Distrikthægen* in the Finn country in the extreme north of Norway reported no cases among the Finns known to them.

² Bulatow reported a case of albinism at the St Petersburg Society of Marine Physicians, November, 1902; see Bibl. No. 498, but we have only seen the reference in Nagel's *Jahresbericht*, Bd. 33, S. 264, Tübingen, 1903.

³ From Libau, we have Dr Ischreyt's case, Fig. 115, containing two albinos, and he speaks of several related albinos.

⁴ See Bibl. No. 427.

⁵ We are hoping to receive specimens of this hair for microscopic examination. It would be interesting to know to what extent there is absence of granular pigment.

Farblosigkeit einen weisslichen Schimmer erzeugten. Trat das Pigment aus der Tiefe weiter herauf, so gab es einen grünlichen oder gelblichen Schimmer; zuweilen sah man aber das seine Blau der Tiefe zwischen dem Weiss der Oberfläche durchleuchten. Zweitens zeigte sich um die Pupille herum eine marginale Zone, welche nicht gedeckt war durch das Reticulum, und gerade hier trat eine stärkere, am häufigsten eine gelbe oder braune Pigmentirung hervor, zuweilen durch kleine, braune Häufchen verstärkt. Auch der laterale Theil der Iris zeigte ähnliche Verhältnisse, nur nicht so scharf und für den äusseren Eindruck bestimmend. So wird es begreiflich dass dasselbe Auge dem eine blau oder bläuliche, dem andern grünlich gelblich oder selbst gelb erscheinen kann" (S. 781).

Those who have studied the albinotic iris, especially among the albinos of dark skinned races, will at once notice how closely this unpigmented network with the "green or yellow eye" accords with that experience. Virchow himself remarks:

"Dieser Zustand hat unverkennbar etwas *albinistisches* an sich; er beruht auf einem Mangel an Farbstoff in den äusseren oder vorderen Theilen der Iris."

In spite of this—and here again we are reminded of the eyes of the partial albinos of many dark races—the eyes of the Lithuanians are not photophobic or in continuous motion; the pupil is black and there is nothing to indicate that any other portion of the eye shares this want of pigment. The skin (S. 781), Virchow tells us, has an "*ungewöhnlich helles Colorit 'weiss'*" and is often "*ungemein zart.*" We are undeniably near the xanthous type of some dark races.

"Der Zustand [des Auges] ist eben eine extreme Steigerung des blauen Zustandes, wie das gelbliche Weiss des Haares eine Steigerung des blondes Zustandes darstellt. Merkwürdig genug ist es zu sehen, wie hier Haar und Augen zusammenwirken, um jenen Eindruck *ξανθότης*, welchen die alten Schriftsteller an den nordischen Völkern einmüthig hervorheben, zu erzeugen" (S. 782).

When we remember that the Lithuanians are now looked upon by many authorities as possibly the existing race closest to the primitive Aryan type, these points are not without suggestiveness. At any rate the results of segregation when this type is crossed on the one side with the Slavonic and on the other side with the Germanic population might offer valuable material not only for albinotic inquiry, but for suggestions in the broader field of racial problems.

Turning to Mid-Russia we have to thank Drs Smirnoff and Odinzow for Figs. 628—9 containing three Moscow albinos. Otherwise we can only note the scanty facts provided with regard to albinism by the returns of a Moscow Ophthalmic Hospital. Trettenbacher¹ records in 8 years, 1845—52, among 46,278 patients only 4 with albinism. This can hardly represent, if we remember that we are dealing with a highly selected population, more than, perhaps, 1 in 100,000 normals. These statistics possibly mark again a paucity of albinism in the Slavonic population of Russia.

We have heard of one or two cases in Poland; thus we have de St Vincent's² case of an albino who was the offspring of a Pole and a German, and Strack's "Polish

¹ *Archives d'Ophthalmologie*, T. 1, p. 92, 1853. *Annales d'Oculistique*, T. 30, p. 132, 1853.

² See Bibl. No. 413.

nobleman" in French service in 1813, aged about 30¹. But here again we see the possibility of hybridism being of special importance.

(iv) *Germany*. A paper which at first sight would appear to provide much useful information as to Prussian albinos is Virchow's report on the great pigmentation survey of school children². As a matter of fact it provides very little valuable information, although Virchow devotes some pages to the discussion of albinism in the returns. The failure in this case is shared by several other school pigmentation surveys. No consideration has been given *a priori* to the category of albinism. If all albinos had been entered as "white-haired" and "pink-eyed," or in a separate class, the information would have been of the highest value; but as we shall now see this is not the case, and it is impossible from the returns to ascertain the exact amount of albinism, even if we exclude the possibility of albinos in Germany being drafted as in England into special institutions. The difficulty lies—when no special category is provided—in two points: (i) in the tendency of the hair of albinos to take a yellow or even a red tinge at the extremities, thus the albino hair may be recorded among the blonds, (ii) if the eye-colour be judged by the iris, it does not follow that the proper description of the albino eye is "red" or "pink," there will be a red reflex, but the iris may appear blue, grayish or even greenish, tinged possibly with red according to the light. Thus if teachers are merely asked as to colour of hair and iris, it is quite possible that the red pupil will escape record, although fully recognised by the recorder. A special entry ought to be directly asked for.

Thus out of nearly 4,000,000 children dealt with about 400 are said to have "white hair." This would give us one albino to every 10,000 children in Germany, a proportion only slightly less than that which Magnus has found for Norway. But some of these children may have been the extreme blonds of Lithuania or Friesland³. On the other hand only 32 children were reported as having "red eyes," and only 23 of these red-eyed children as having "white hair," which gives us a complete albino only once in about 200,000 children! The fact is that this and other pigmentation surveys have not been designed to bring out the true prevalence of albinism.

Of the 23 children "white-haired with red eyes" 17 came from Prussia, three from Bavaria and one each from Baden, Braunschweig and Oldenburg. Of the 32 red-eyed children all are said to have had white skin but one, who is credited with red hair and a brown skin. Of the nine red-eyed who had not white hair, six are described as "blond," which in this case is probably only the flaxen yellow of many complete albinos; two are credited with red hair and one with "brown," the latter being probably some form of red as the skin was white; there would thus be three "rufous albinos," of the type we shall have several occasions to refer to in this memoir. That out of 32 red-eyed children 2 or 3 should be rufous, *i.e.* 6 to 9 per cent., whereas under $\frac{1}{2}$ per cent. of red hair occurs in the population at large, does not seem to bear

¹ See Bibl. No. 457.

² See Bibl. No. 1109.

³ Phoebus (see Bibl. No. 207) was, we think, the first to draw attention to the extreme blondism of some of the Friesland peasantry as amounting almost to a mild form of albinism, and the point has been much emphasised in a letter to one of us from Dr Meyerhof of Cairo, who belongs to Friesland.

out Virchow's statement that these numbers are the best proof that no relationship exists between "red hair" and "red eyes"! We shall see later that there exists a real tendency for the rufous to break down into the albinotic. A possible four cases of "red" and "yellow-red" eyes were reported from Württemberg, and these may also have been albinos¹.

If we turn from the school survey to the literature and our own records, we find at once that albinism must be fairly frequent although we are not in a position to say how its frequency compares with that of Norway, Sicily or England. The smallness of the response to our appeal in the German medical papers for cases of albinism cannot be interpreted as evidence of its infrequency, for at least one of us has found that letters courteously asking for information as to books or papers, which a few years ago would have received a ready reply, no longer are granted attention in Germany. We have, however, to thank several German colleagues for providing interesting cases. Of new German cases we may note those of Dr P. V. Richter from Hamm in Westphalia (one complete albino), Fig. 194, of Dr Marhol from Iserlohn in Westphalia (two complete albinos), Fig. 549, and of K. Pearson, Fig. 487 (three complete albinos from Hesse). We have 28 published pedigrees², these embrace 74 albinos from Marburg (3), Mainz (4), Würzburg (8), Giessen (3), Leipzig (6), Göttingen (1), Wiesbaden (8), Wolfrathshausen (3), and more vaguely, Swabia (3), Elsass (7), Harz (8), Brunswick (4), Schwarzwald (1), and unstated (15). Of cases not included in our pedigrees, there exist at least twelve³: Münster (2), Saxony (2), Gotha (1), Brunswick (3), Bavaria (1), Silesia (1), Prussia (1), and unstated (1). This gives at least 92 German reported cases, which are independent of the somewhat indefinite numbers reported in the German school pigmentation survey. About one-tenth of these are incomplete albinos. Of the 92 cases 31 are male, 29 female and 32 unsexed. This is a poor harvest for a populous country like Germany, and we have very likely missed a considerable number of isolated published cases. No thorough study of the frequency and distribution of albinos in Germany has, we believe, been made, and although it is quite possible that the frequency of albinism is rather less in Germany than in countries with more mixed populations, yet it is impossible to point to any very good statistical or genealogical work done on the subject in Germany, and the published German pedigrees are of very small value. The best German work upon albinism has undoubtedly been on the physiological side.

(v) *Austria*. From the mixed population of Austria, we should expect to find a considerable number of albinos. Our data are, however, slender. We publish three

¹ The actual distribution of the 23 cases was as follows: Oelber a. W., Wolfenbüttel; Selb, Rehau, Oberfranken; Lohr, Hammelburg, Unterfranken; Sulzthal, in the same; Ratibor; Minden (2 in one school); Kreise Friedland, East Prussia (2); Angerburg, Gumbinnen; Stargard, West Prussia; Berlin; Wissitz, Bromberg; Breslau; Halberstadt; Aschersleben; Eckartsberga; Altona; Büren; Mühlheim a. Rh. (a Jew); Unterlahnkreis; Heidelberg; Oberstein, Oldenburg.

² Figs. 73, 75, 143—4, 150—3, 235, 242, 247—8, 260, 264—5, 299, 352, 374—5, 377—9, 403, 406, 408, 438, 452, 570.

³ See Ansiaux fils, Bibl. No. 142, Phoebus, No. 207, Pickel, No. 106, No. 107, Esquirol, No. 217, Seiler, No. 201, Talko, No. 335, etc., etc.

new pedigrees, Figs. 6 and 7 from Dr V. Hanke of Vienna, which contain five albinos, and Fig. 445 due to Professor Fuchs of Vienna and containing particulars as to two very interesting partial albinos. The published matter known to us is also very slight, and covers several races of this heterogeneous empire. In 1836 Dr Herzig reported the case of an albino boy from Haid in Bohemia¹, and Fischer in 1832 operated in Prag for cataract on the eyes of an albino woman². From Hungary we find references to a few cases, Pastor Klein in his *Naturseltenheiten des Königreichs Ungarn*, 1778³ refers to an albino girl, and Jellinek in 1857⁴ notes certain cases of partial albinism. An albino from Siegartskirch and possibly a few from Salzburg⁵ complete the slender material we have been able to collect as to Austria.

Indirectly we have some data as to the frequency of partial albinism. Pilcz and Wintersteiner⁶, whose statistics will be dealt with later, examined 707 insane persons in the Universitätsklinik at Vienna ophthalmoscopically and found no less than 36 with albinotic fundus, although they came across no complete albinos. According to this one in twenty of the insane exhibits partial albinism. The insane cannot, however, be taken as a normal sample of the population as far as albinism is concerned; we shall see, as Pilcz and Wintersteiner point out, that albinism is only one of the signs of general degeneracy. If, however, the sample of the insane was a random sample, and we supposed no sane individuals at all to suffer from partial albinism, we should conclude that 1 in 400, or 1 in 2000 of the general population of Austria was partially albinotic, according as we selected 5 or 1 per cent. to measure the number of persons in that country insane at some time during their life. The prevalence of partial albinism thus indicated seems large, but if the association with insanity be considerable, it would possibly escape the notice of ophthalmoscopists working chiefly among the normal population.

(vi) *Holland*. While we can refer to no published data, we have, thanks to the courtesy of Drs Koster and Schoute, quite a number of interesting pedigrees here given for the first time. See our Figs. 113, 207, 208, 210, 226, 496. These contain 17 Dutch albinos; we have also knowledge of seven further cases of Dutch albinos sent most kindly to us by Prof. Koster, or a total of 24 albinos from Holland, some three of whom are partial. It is noteworthy that 18 of the reported Dutch albinos are female, only six are male⁷.

(vii) *Great Britain*. Passing to our own country we have three sources of material, (a) published pedigrees and reports of cases, (b) new material engraved in the plates of this memoir, and (c) single cases reported to us without any investigation of family history, or where the family history could not be ascertained. We find that (c) contains only 12 albinos, of whom no less than nine were, in various grades and modes, incomplete. This list could have been rendered larger, but we have only formed it incidently in seeking material for (b).

¹ See Bibl. No. 1099.

² See Bibl. No. 197.

³ See Bibl. No. 87.

⁴ See Bibl. No. 265.

⁵ See Bibl. Nos., 135, 145, etc.

⁶ See Bibl. No. 518.

⁷ We have in addition, what are of considerable importance, one albino, the offspring of a French father and Dutch mother (see Fig. 63), and two albinos, the offspring of Dutch-Portuguese descent (see Fig. 336).

(a) Of the published references I think the earliest is the epitaph of the boy who died in 1632, which was formerly in Worsborough Church in Yorkshire¹, and has already been referred to (see our p. 12 fn.). Other early English cases are those of Duddell (a boy, St Martin's Lane, London, aged 14, 1736, very prominent corneas "obtused like cones," "the globes were trembling or quivering, which is called Hippos, and the ruby pupils were the most curious of any." Duddell cites Woolhouse, who had apparently seen a case, and compared with the choroides of white rabbits. Duddell himself dissected the eyes of albino rabbits and found the choroides "something of a fleshier Red than the Retina, or than the Retina of those Rabbits that have their choroides Black, which I compared together." He was the first we believe to measure the refraction of an albino, and found the focus about 5 inches to the right eye, and somewhat longer to the left, so that he held things "more obliquely to that temple." Duddell considered the boy's sight as good as that "of a great many Myopes is in the Day, viz. of his Focus." Mother attributed the eyes to her having witnessed a battle between two bats with red and flaming eyes during her pregnancy: see Bibl. No. 55); of John Hunter (a boy at Shepperton, aged 13, 1786, white hair, red pupils, photophobia, no mention of nystagmus. Hunter attributed myopia to the habit of screwing up the eyeballs to avoid light: see Bibl. No. 99); of Nicholson (3 ♀'s, Essex, 1808, Fig. 362 and "England" 1 ♀, 1 ♂: see Bibl. No. 144); of Marshall (several, offspring of a male albino, "North of England," 1832, Fig. 407); and of Doyère (an old man and old woman in Bedfordshire, cited by Cornaz, Bibl. No. 256, p. 280).

The locus of published cases of later date is not generally given; we have records of 16 ♂'s and 11 ♀'s who were completely, and 12 ♂'s and 8 ♀'s who were incompletely albinotic.

(b) Of the new material in this memoir we have from London 77 ♂'s, 51 ♀'s completely albinotic, 44 ♂'s, 31 ♀'s incompletely albinotic. The description, "London," however is very vague. Many of them are probably immigrants from the home counties, or may merely have come into London for advice. Starting from the North we have Northumberland (4 ♂'s, 3 ♀'s), Cumberland (3 ♂'s, 5 ♀'s), Durham (5 ♂'s, 1 ♀), Yorkshire (3 ♂'s, 1 ♀), Lancashire (17 ♂'s, 9 ♀'s, 9 unsexed, and 6 ♂'s, 6 ♀'s incomplete), Derbyshire (2 ♂'s, 1 ♀), Staffordshire (3 ♂'s), Nottinghamshire (3 ♂'s, 1 ♀), Lincolnshire (1 ♂, 1 ♀), Leicestershire (2 ♂'s, and 1 ♂ incomplete), Warwickshire (4 ♂'s, 3 ♀'s, and 13 ♂'s, 3 ♀'s incomplete), Herefordshire (1 ♂, 2 ♀'s), Worcestershire (2 ♀'s), Bedfordshire (6 ♂'s), Cambridgeshire (6 ♂'s, 2 ♀'s, and 3 ♂'s incomplete), Suffolk (7 ♂'s, 5 ♀'s, and 1 ♂, 3 ♀'s incomplete), Oxfordshire (2 ♂'s), Buckinghamshire (1 unsexed, and 1 ♂ incomplete), Berkshire (2 ♀'s), Essex (1 ♂, 2 ♀'s, and 9 ♂'s, 1 ♀ and 6 unsexed incomplete), Devonshire (2 ♂'s, 1 ♀), Dorsetshire (1 ♂), Hampshire (5 ♂'s, 2 ♀'s, and 2 ♂'s, 2 ♀'s incomplete), Surrey (1 ♀ and 4 ♂'s, 3 ♀'s incomplete), Sussex (3 ♂'s, 1 ♀), Kent (1 ♂, 1 ♀), and vaguely "South of England" (3 ♂'s, 2 ♀'s, and 1 ♂, 1 ♀ incomplete). It appears almost impossible from this material to deduce any conclusions as to

¹ See Bibl. No. 209. There is no doubt, however, that Philemon Holland who published his translation of Pliny, First Ed. 1635, was fully cognizant of the general characteristics of albinism: see our p. 23 fn.

distribution; we note that Cornwall has provided no cases. From allied Wales we have only 8 ♂'s and 3 ♀'s, of which 5 were found in publications (4 ♂'s, Anglesea, Fig. 261, and 1 ♂, Pembrokeshire, Fig. 205). In Ireland we have 2 ♂'s, 3 ♀'s and 1 ♂ incomplete from Dublin, 5 ♂'s, 2 ♀'s and 2 unsexed from Belfast in our material. Published material provides four peculiarly interesting cases: Perceval's case of Jane Bern (aged 11, 1790, she had vertical and rotatory nystagmus—possibly the first case recorded, she read with the lines of her book vertical, or parallel to the sagittal plane of the head; red pupils, and irides of uniform deep red approaching brown, fine hair, somewhat whiter than flax, she came from Longford in North of Ireland, see Bibl. No. 117), Graves' cases (1 ♂, 1 ♀), in one of which the irides lost the red reflex and the hair changed from white to light brown (see Bibl. No. 213, p. 79, 1845), and Wilde's case of Master D., aged 3, whose eyes originally of bright pink, had later light lilac blue irides and violet red pupils; the hair changed from white to a dirty cream colour, but the vision did not improve with the development of colouring matter (see Bibl. No. 285, p. 81, 1862). It will be noted that from Cornwall, Wales and Ireland we have relatively few albinos¹, but we should not venture to suggest that few Celts are albinotic. On the contrary we shall see later that one markedly Celtic type leads frequently to albinism when crossed with other types. It is just possible that such crossing is not frequent in the districts mentioned², but the absence of albinos is probably chiefly due to the paucity of reporters in the country districts.

If we turn to Scotland we have very much larger numbers to report. Of the early published cases Carron du Villards reports a young albino Scottish woman born in the Malaccas, but living at the Cape (see Bibl. No. 218, p. 63, 1838), but we have noticed no other references. Our own material provides of complete albinos 92 ♂'s, 76 ♀'s and 4 unsexed, and of incomplete albinos 24 ♂'s, 34 ♀'s, and 2 unsexed. These are distributed as far as districts are determinable as follows: Aberdeen and Aberdeenshire (21 ♂'s, 31 ♀'s and one unsexed, 14 ♂'s, 19 ♀'s incomplete), Banffshire (2 ♂'s, 0 ♀'s, and 5 ♂'s, 5 ♀'s incomplete), Dumfriesshire (6 ♂'s, 3 ♀'s, and 1 ♀ incomplete), Elgin (3 ♀'s incomplete), Fifeshire (3 ♂'s, 1 ♀, and 2 ♂'s, 1 ♀ and 2 unsexed incomplete), Glasgow (13 ♂'s, 9 ♀'s), Dundee (4 ♂'s), Inverness (9 ♂'s, 5 ♀'s, and 1 ♂ incomplete), Perthshire (11 ♂'s, 8 ♀'s), Orkney (5 ♂'s, 1 ♀), Hebrides (2 ♂'s, 4 ♀'s), Skye (3 ♂'s, 5 ♀'s, and possibly 5 ♂'s, 5 ♀'s incomplete), Iona (2 ♂'s, 2 ♀'s). Several cases were merely described as "Highlanders," or were the offspring of parents from different districts. In the following Scottish districts inquiry led to the statement that no albinos existed: Shetland and Orkney (other than Fig. 100 given), Banff (Aberchirder, Keith, Tomintoul), Forfar (Breachin, Montrose), Elgin (Fochabers), Aberdeen (Hatton,

¹ We have twice heard of Cornish cases, but got no answer to inquiries. The parents were Irish in Fig. 593.

² Wilde (loc. cit. supra p. 83) gives the statistics of eye-colour observed in a hospital registry for 18 months in Dublin. Out of 2776 individuals, 1884 had light eyes, 752 blue, 1132 grey in the proportions 992 ♂'s to 892 ♀'s; 288 had hazel eyes and 604 dark eyes, varying in shade from light brown to "black" in the proportions 470 ♂'s to 422 ♀'s. Thus the light-eyed population about Dublin is to the dark-eyed in the proportion of about 2 to 1. Unfortunately he does not tell us how many of these light-eyed had dark hair and how many light hair, so that we cannot test the probability of racial crosses.

Port Errol, Fraserburgh), Ross (Tain, Gairloch, Torridon, Applecross), Mull (Bunessan, Salen), Skye (Dunvegan, Uig, Broadford, Carbost, Isle Ornsay), North Uist, Lewis (Stornoway, Barvas), Islay, Sutherland (Scourie). In these districts there are either no albinos or we have their cases. Probably there are not many albinos in Aberdeenshire, Kincardine or Banff we have not heard of.

An attempt was made to prepare a distribution map of the Scottish albinos, but the spots marking cases were seen to be so influenced by the centres at which we had active contributors that nothing could really be learnt from the chart.

At the Glasgow fever hospital (Bellevedere) Dr Brownlee informs us that he has seen one albino in eight years' fever experience, which amounts to about 3000 cases per annum. This would mean one albino to about 20,000 to 25,000 persons. We have records of between 100 and 150 *living* albinos in Scotland, and the districts we have covered contain not quite half the population. It seems probable therefore that there exist 200 to 300 albinos in Scotland, which would give us one albino to every 15,000 to 25,000 inhabitants. Dr H. Wright Thomson, the ophthalmologist to the Glasgow School Board, says that in three years for the Glasgow Board and Voluntary Schools, he has found two albinos among 90,000 children, both of these were in special schools, one in a blind asylum and the other in a class for the mentally defective. But inquiries at various centres in Glasgow have led us to the discovery of five or six other children of school age in Glasgow who are albinos. Some of these may be in the Govan district, which is not in the School Board area. We have then seven or eight albino children among, perhaps, 100,000 of school age. This works out roughly to about one in 13,000 to 15,000, and considering the usual weakness and therefore higher death-rate of albinos, would not differ very much from one in 15 to 20,000 for the *general* population.

If we admit in Scotland one albino say to 21,000 and call a family a group of five children with their parents, we should expect one albino to 3000 families. But it is rare to find one albino in a family only, the average is certainly two or more; hence we may say that there is patent albinism once in every 6000 families. Now every albino family with five children should give rise to four or five new families, in three of which albinism might be latent, although some of the brothers and sisters of the albinos should be free from the taint. On the other hand the albinos have a higher death-rate. We shall probably err in excess, if we assert that for every patently albinotic stock there are six with latent albinism¹. If we take this number, we must hold that albinism latent or patent only occurs once per 1000 families in Scotland. Apart therefore from marriage of kin, the odds must be very great—roughly a million to one—against an albinotic stock marrying an albinotic stock. We might have to modify these numbers, if we could point to albinism clustering round certain districts in Scotland, but our statistics show no signs of such being the case. The condition that albinism should exist in both parent stocks, if needful for the appearance of albinism, ought to be indicated by an overwhelming amount of consanguineous marriage in the parents of albinos. It is noteworthy that whereas in non-

¹ It is relatively rare in the case of a complete pedigree for an albinotic sibship to show no past history of patent albinism.

consanguineous unions leading to albinism, we very frequently find traces of albinism in the ancestry or collaterals of one parent stock, it is of extreme rarity to find traces in both parental stocks. With about seven to a family, we should find some 600,000 families in Scotland and of these say 600 would be albinotic. If these albinotic stocks could produce albinos without intercrossing we should reach the 200 or 300 albinos, which appear to be about the existing number. But if they have to intermarry to produce albinotic offspring, the number of albinos in Scotland seems far in excess of the probable. Even if we increased our albinos to one in 8000 to 10,000, an estimate more near to Fijian, Norwegian or Sicilian results, we should not find any reasonable chance that albino stock would marry albino stock unless we segregated such stocks or increased much beyond possible values the consanguineous marriages in the community. These points will be discussed more in detail later, but our Scottish statistics suggest round numbers for consideration.

(viii) *Spain and Portugal.* If we pass to the Latin races, we have no data whatever from Spain or Portugal. "Chapman" has been cited¹ as authority for the occurrence of albinism in Spain. But we have not been able to trace any likely author of this name.

(ix) *France.* Our plates² contain 17 ♂'s, 8 ♀'s and 9 unsexed with one incomplete ♀. Besides these we have only found some 34 cases in medical literature. Splendid as the French pedigree work has been in certain directions of pathological defect, but little appears to have been done in France with regard to albinism. This may mark an absence of material, or possibly an absence of interest. Besides the short pedigrees on our plates we have other cases of French albinos referred to by Cornaz [Bibl. No. 256 (p. 299), a girl, Department of l'Hérault, a boy and a girl from Montpellier (p. 300), a woman of 37, a female infant, both from Sichel's Paris Ophthalmological Dispensary (pp. 309 and 389) and a partial male albino at Montpellier (p. 320)]. Ansiaux³ gives two cases, one of which seen at Liège was born near Münster. Gaultier⁴ refers to four cases, two from Bourbon. Rayer⁵ and Blandin⁶ refer to the albino imbecile, named Roche⁷, for many years one of the sights of Bicêtre, and Blandin mentions an entire family of albinos ("une famille entière d'albino") as existing at Choisy-le-Roi. Breschet⁸ refers to an albino man and woman, presumably French, shown to the Paris Faculty of Medicine in 1809; he also speaks of *several* albinos (not only Roche?) in a state of complete idiocy among the insane at Bicêtre. Haldat⁹ in 1810, writing for the time very reasonably of albinism,

¹ By Eble in 1831 (Bibl. No. 196). He gives, however, no work under this author's name and not even his initials. There is no certainty that the author referred to was English. There was a Chapman who wrote a paper on negro albinos, either in Danish or translated into Danish, before 1766. Chapman very likely cites Maupertuis (1756), who mentions a white *negro* in Spain on the authority of "milord maréchal"; see Bibl. No. 58 and cf. No. 70.

² Figs. 63—65, 74, 77, 190, 233—4, 239, 249, 263, 316—7, 321, 439, 499, 547.

³ Bibl. No. 142.

⁴ Bibl. No. 147.

⁵ Bibl. Nos. 109, 179.

⁶ Bibl. No. 191.

⁷ Roche went to the asylum when nine years old and was known as the "l'apin blanc." He was seen, when aged 43, by Rayer. There was photophobia and nystagmus, blood-red pupils; the intellectual faculties were extremely poor; he was an only child, and mother attributed his albinism to her being frightened during pregnancy by "un gros chat blanc."

⁸ Bibl. No. 170.

⁹ Bibl. No. 146.

reported three albinos in the population of Nancy, which did not exceed 30,000, and two others in a neighbouring commune, and another in the same Department. He further records two partial albinos (see our Appendix A, p. 82). It would therefore appear that in 1810, the albinism round Nancy was certainly up to the level of one in 10,000 to 20,000. Esquirol¹ in 1838 mentions two albinos from the mountains of Auvergne who had been shown in Paris (? are these Breschet's cases) and mentions beside the case given in our Fig. 439, the almoner of a Paris hospital, an albino who spoke several languages. Belivier² in 1803 refers to a Parisian woman of 19 years of age, who was an albino without any detail as to family history. Charcellay³ exhibited in 1851 an albino male of 34 years who was in the hospital at Tours; his family came from the Department of the Gironde, and the patient, a complete albino, said that there was no other case among his relatives. Dor and Villard⁴ have operated for cataract on an albino man at Lyons in 1885 and on an albino woman at Montpellier in 1904 respectively. Maurice Raynaud⁵ in his article on "Albinisme" describes an albino young man, who read in the characteristic albino fashion (cf. our Plate O (45)). These with a few further isolated references form the bulk of our French gleanings. Altogether we have recorded 28 ♂'s, 23 ♀'s and 6 unsexed complete, 3 ♂'s and 1 ♀ incomplete albinos. We do not believe this indicates a relative paucity of albinos in France. Ophthalmological writings by Frenchmen seem to prove that it is sufficiently prevalent to be discussed. Thus Picqué⁶ was the first or among the first to suggest the application of the pin-hole visual arrangement to the albinotic eye as a method of making their vision more distinct—an arrangement which more than one albino has found of service. On the whole it appears to us that a comprehensive study of albinism in France would much aid our general knowledge of the subject, and would probably throw those fascinating new lights on the matter which we are accustomed to find when the French attack any phase of pathological heredity.

(x) *Belgium*. We have practically no data beyond the Liège case referred to among the French cases above. According to Cornaz⁷, Roosbroeck in his treatise⁸ states that he has seen several cases. Ossieur's paper⁹ which describes a complete case of albinism has proved quite inaccessible, and we cannot even determine whether the patient was a Belgian.

(xi) *Switzerland*. We may take Switzerland on our road to Italy. The chief contributors to our knowledge here are Cornaz (7 ♂'s, 14 ♀'s and 1 ♂ incomplete from Berne, Canton Fribourg, Yverdon and Servion: see our Figs. 223, 225, 313—315), Brière (7 cases from village of Yverdon district: see our Fig. 236¹⁰), Blumenbach,

¹ Bibl. No. 217.

² Bibl. No. 137.

³ Bibl. Nos. 251 and 263.

⁴ Bibl. Nos. 395 and 519.

⁵ *Nouveau Dictionnaire de médecine*.

⁶ Bibl. No. 410.

⁷ Bibl. No. 256, p. 281.

⁸ *Cours d'Ophthalmologie*, T. I. p. 118, Ghent, 1853. We have been unable to find a copy.

⁹ Bibl. No. 247.

¹⁰ Since the printing of our account of Fig. 236, we have been able to see a copy of Brière's *Note* owing to the kindness of the Directeur de la Bibliothèque de la Ville de Neuchâtel. There is little to add to our description beyond the locality Yverdon, the completeness of the albinism in all cases, the fact that

de Saussure and Carron du Villards (3 ♂'s, 1 ♀ from Chamouni: see our Fig. 405). Our Swiss data therefore on the plates cover 10 ♂'s, 15 ♀'s and 1 ♂ incomplete besides the seven unsexed cases of Brière, which may possibly be in part those of Cornaz (see *ftn.*). Troxler¹ refers vaguely to albinism associated with Cretinism in the Valais. Blumenbach² records a male albino at Neuchâtel and another at Yverdon itself. There is a vague reference to albinism occurring in several districts in Switzerland in Reynier³. Finally Jakob⁴ records the case of a girl from near Berne. Thus our total for Switzerland stands at 13 ♂'s and 16 ♀'s and a possible additional 7 unsexed. This is not a very full harvest, and we believe that the mixed population of Switzerland ought if carefully investigated to give a much heavier list. If it does not, the inbreeding of the shut-in mountain valleys cannot be (as we have seen it does not appear in Norway to be) productive of albinism. One of our number after much inquiry has recently come in touch with the modern representatives of Cornaz's Chassot-Rey stock and there is some hope that we may be able eventually to bring Cornaz's chief pedigree down to date.

(xii) *Italy*. From Italy we have far better data. Arcoleo⁵ gives some particulars of 22 families (see our Figs. 154—175) containing 34 ♂'s and 28 ♀'s. Unfortunately there has been no endeavour to trace the ancestry of these cases fully, and further the degree of albinism is never stated. They show, however, that albinism must be rather common in Sicily, and the prevalence of extreme blondism among the dark population there, a clear survival from the Norse occupation, is further evidence that albinism arises where we find a population of mixed pigment types. Mantegazza⁶ reports a male albino in Milan (Fig. 240), Buzzi's⁷ classical memoir records three from a much earlier date from the same town (Fig. 237). Pearson gives a pedigree of two albinos from Urbino (Fig. 320) and three male partial albinos have been reported from Verona⁸ and a complete male albino from Venice⁹, a female albino at Rome¹⁰ and a whole family near the latter city¹¹. E. Nettleship saw an albino child in a village on the west side of Lake Como in 1905.

In addition to these albinos we have Rizzoli's remarkable pedigree of a white lock family, containing 12 ♂'s and 8 ♀'s, probably as in other cases¹² partial albinism of the skin was associated with this partial albinism of the hair (see our Fig. 491). We have endeavoured by applying to the Syndic of Imola to get in touch with the three out of the five siblings died early, one from a fall, and the others from unknown causes, one out of the second pair also died early. The elder brother by his second non-consanguineous marriage had *four* healthy normal children. There is some probability that the Brière case is a later version of the Cornaz-Wartmann pedigree, Fig. 225. Brière mentions no names but says the family came from A. O... a village near Yverdon. Cornaz gives the names Dutoit and Dubry and calls the village "la tuilerie d'Oppens" near Yverdon. He, however, does not refer to the cousinship of the two husbands and wives, which is a vital point, and gives only three as against Brière's five albinotic offspring to the elder brother's first marriage.

¹ Bibl. No. 300. For a criticism of Troxler see our chapter on the albino skin.

² Bibl. No. 97, p. 545.

³ Bibl. No. 92, p. 22.

⁴ Bibl. No. 227.

⁵ Bibl. No. 315.

⁶ Bibl. No. 308.

⁷ Bibl. No. 95.

⁸ Bibl. No. 196, II. p. 308.

⁹ Bourguet: "Lettre philosophique sur la formation du sel et des cristaux," Amsterdam, 1729, p. 162.

¹⁰ Blumenbach on the authority of J. Hawkins, Bibl. No. 125, § 78, *ftn.*

¹¹ Cardinal Wiseman, Bibl. No. 252.

¹² See our Fig. 529, and compare Fig. 562.

modern representatives of the Bianconcini, but we have not hitherto been successful. The name (? = "white hook") seems to carry us back beyond the recorded six generations into mediaeval times.

In Italy the only attempt, that we are acquainted with, has been made to obtain a census of albinism. This was done by aid of inquiry schedules issued to the parish priests by the Italian Anthropological and Ethnological Society, and Raseri¹ has reported on the material thus collected. It would be ungracious and idle to criticise a first attempt of this kind. The Italians have done what no other nation has attempted. Still the interpretation of the results demands some words of caution and this for the following reasons. The population dealt with only covers about one-tenth of the Italian nation, and it seems exceedingly probable that in the urban districts the informants would miss a good many albinos. Hence we are likely to obtain an underestimate. Thus the population said to be dealt with in Sicily is 321,232, providing 7 albinos. But in four years the conscripts of Sicily produce 5 albinos exempted from military service, the male population of albinos between 18 and 22 can hardly be more than $\frac{1}{16}$ to $\frac{1}{14}$ of the total male albino population; hence we should expect 70 to 80 male albinos in Sicily and 130 to 150 albinos of both sexes. This in a total population of 3,400,000 gives one albino in 22,000 to 26,000 inhabitants. The Anthropological Society's census (A. S. census) gives one albino to 46,000. Again Arcoleo², working in Palermo, found 62 albinos. Of these 44 were seen and he tells us that they were drawn from a population of 254,517 persons in Palermo and the neighbourhood. This at first sight gives one albino to every 5000 to 6000 persons. But there is, we think, a fallacy in this manner of reckoning. He has only put down the places in which he found albinos to exist, and some of the places are at least 25 miles from Palermo. It is quite reasonable to suppose that he had covered a much larger population than is indicated by the size of the towns in which he actually found albinos. Further, his 44 living albinos were those he had himself seen in a number of years of ophthalmological practice, and it is not at all likely that they were all alive at one time. We might probably safely double the actual population dealt with by Arcoleo and reduce the number of albinos alive at one time to 30 or 35, which agrees very well with our general experience that half the albinos put on record may be considered to be alive. In this case for Arcoleo's district we should find one in 14,000 to 16,000 persons was an albino. This result shows three times as many albinos in Sicily as the A. S. census.

The A. S. census gave 111 albinos of both sexes in a population examined of 3,217,536 or one albino in 29,000 for all Italy. Now the *Relazioni annuali sui Risultati della Leva* gave in the reports for four years, 1876—1879, the numbers of albinos rejected,—albinism being taken as a ground of unfitness. We find:

	Total of Levy	Albinos
1876	248,022	11
1877	269,585	5
1878	291,717	12
1879	285,740	29
Together:	1,095,064	57

¹ Bibl. No. 361.

² Bibl. No. 315, p. 586.

Thus there was one albino in 19,212 young men examined. This must, however, be rather too frequent for the population as a whole, first because male albinos are more numerous than female, and secondly because the albino has a shorter life than the bulk of the population. Hence one albino to the 19,000 is a maximum limit to the frequency. If we suppose that none of the albinos, rejected in 1876—8 were dead in 1879, we might conclude that there were 57 male albinos of the ages 18, 19, 20 and 21 alive at one time in Italy. If then we had an age-distribution of a random sample of Italian albinos, we could ascertain the total number of albinos in Italy. But Arcoleo¹ and the Census both give us an age-distribution of albinos.

Arcoleo	♂'s + ♀'s	A. S. Census	♂'s	♀'s
Up to 10 years	25	Under 10	11	4
11—20	16	10—20	14	10
21—30	7	21—30	10	6
31—40	1	31—40	12	4
41—50	4	“Adults”	4	—
51—60	2	51—60	2	3
		61—70	5	2
Total	55	Total	58	29

Now examining these results we notice that Arcoleo finds rather more than one albino per year of age from 11 to 20, and rather less from 21 to 30. He has also 2·5 albinos per year of age in the infant period, indicating that the rather more than one per year of age in the 11—20 period belongs to the earlier part of it. It seems to us that four albinos for the years 18—21 must be a reasonable approximation, or we should have albinos of these ages about $\frac{1}{14}$ for the albino population. The A. S. Census gives practically the same result, namely rather more than one albino per year from 10 to 20 and one albino per year from 21 to 30; thus making the male albinos of 18 to 21 again almost $\frac{1}{14}$ of the total male albino population. While the females of the A. S. Census give 7 albinos per year for 18 to 21 and these form $\frac{1}{10}$ of the female albino population, it does not seem likely that 58 ♂'s to 29 ♀'s really represents the sex ratio. Arcoleo found 34 ♂'s to 28 ♀'s, and this 5 to 4 ratio seems far more in keeping with our other experience. The preponderance of the male albino is evidenced, however, in Italy as elsewhere.

If now we take $\frac{1}{14}$ to represent the male ratio we see that 57 albino conscripts correspond to a total male population of 798 albinos in Italy and on the 5 to 4 ratio we should expect 638 female albinos, or a total of 1436 albinos in 34,000,000 inhabitants, or one albino in 23,000 to 24,000 persons. This is very closely in accord with the estimate we have made for Scotland; it is a rather greater frequency than the one in 29,000 of the A. S. C. It is noteworthy, however, that the A. S. C. records give 69 ♂ albinos in about 16,000,000 males or a little over one in 23,000. Thus as far as males are concerned the A. S. C. and the conscript returns give sensibly identical frequencies of albinism in Italy, and results agreeing with our best values for other countries. The divergence arises solely from the relative paucity of

¹ Bibl. No. 315, p. 587.

female albinos recorded by the A. S. C.¹ If we take from the conscript returns 798 male albinos for Italy and add to this females in the ratio of 42 to 69 as given by the A. S. C. we find only 486 female albinos or 1284 albinos of both sexes, thus giving one albino to 26,500 Italians. It is possible that this is the correct view, but we are inclined to think that the number of female albinos in the individual returns for Puglia and the Upper Neapolitan Province have been much underestimated. As it is, we may say that the Italian records give us the best return hitherto available, namely one albino in 23 to 26,000 persons. A word of caution should here be added. In the replies to the schedule issued no account was taken of the degree of albinism; probably the degree should be considered as that of complete albinism and of the most conspicuous forms of incomplete albinism.

The following table embraces the chief results of the A. S. Census as indicated by Raseri. The average age of the 142 albinos recorded by Arcoleo and the A. S. Census is 22.3 years, but the latter record clearly fails in giving the due proportion of albinos under 10 years. The average age of the albinos over 10 years of age is 29.1 years. In the general Italian population we find, according to the census of

District	Population observed	Albinos			Number to one albino	Percentage of consanguineous marriages	Percentage of multiple births	Percentage of communes with white skin	Percentage of communes in which black hair predominates
		♂	♀	T.					
Piedmont	237,709	3	4	7	34,000 -	14.31 +	1.25 +	44 +	29 +
Liguria	76,789	—	1	1	77,000 -	21.23 +	0.85 -	44 +	22 -
Lombardy	254,766	2	1	3	65,000 -	10.13 +	1.48 +	41 +	33 +
Venetia	405,092	7	8	15	27,000 +	2.62 -	1.67 +	32 -	11 -
Emilia	939,040	7	5	12	78,000 -	4.50 -	1.54 +	29 -	20 -
The Marshes						0.65 -	1.37 +	24 -	
Umbria	33,698	1	—	1	34,000 -	1.03 -	0.98 -	—	52 +
Tuscany	138,345	7	2	9	15,000 +	4.02 -	1.68 +	16 -	27 +
Rome	—	—	—	—	—	7.08 +	1.31 +	—	—
Abruzzi	—	—	—	—	—	3.08 -	0.90 -	—	—
Campania	440,518	17	10	27	16,000 +	2.78 -	1.00 -	48 +	18 -
Puglia	342,265	19	5	24	14,000 +	3.52 -	1.05 -	51 +	21 -
Calabria						5.91 -	0.84 -		
Basilicata						3.87 -	0.87 -		
Sicily	321,232	3	4	7	46,000 -	12.21 +	0.92 -	46 +	63 +
Sardinia	28,082	3?	2?	5	5,600 +	6.06 -	1.19 -	40	18 -
Totals	3,217,536	69	42	111	29,000	7.01	1.22	40	26

The + and - signs in the albino column indicate excess and defect of albinism; in the other columns they indicate excess or defect of the quantity observed on its mean value. A cursory inspection of these signs shows that no *marked* positive or negative correlations exist between prevalence of albinism and consanguinity in marriage, fertility as marked by multiple births, frequency of white skin or darkness of hair.

¹ Raseri evidently lays less stress on the 69 to 42 sex ratio than statistically, considering the numbers dealt with, it justifies. Thus he writes that "it cannot yet be admitted as certain that women are less subject to albinism than men." He must therefore attribute this great divergence of 69 to 42 to some error of his record.

1881¹, the average age was 28·5 and the average age of all over 10 years was 37·1. These numbers appear to indicate a markedly increased mortality of the albinos.

The combined results of the above table are not very conclusive in any single direction. When it is noticed that the discovery of a single additional albino in Liguria or Umbria would have immensely altered the position of these provinces, and when we remember from the case of Sicily how more than probable it is that many albinos have been omitted, we can lay but little stress on any individual result. Some general conclusions may, perhaps, be tentatively reached:

(i) Albinism seems less frequent north of the Apennines in Piedmont, Liguria, Lombardy, Emilia and the Marshes. Venetia forms an exception. The first three have a great excess of consanguineous marriages, of white skin and dark hair. Venetia with a low consanguineous rate, with dark skin and a preponderance of chestnut and blond hair produces double the number of albinos.

(ii) Albinism is most frequent south of the Apennines in Tuscany, Campania and especially Apulia, Basilicata and Calabria. Leaving Tuscany out of account we have here an excess of dark skin, a defect of black hair and a lower consanguineous rate. In Tuscany and Umbria we have a defect of white skin and an excess of black hair.

As in the case of Norway we think we must conclude that shut-in mountain valleys with a high consanguineous marriage rate are not productive in a marked degree of albinism. We see also that fertility as judged by multiple births appears to have no special relation to albinism².

According to Raseri the frequency of albinism is greatest where the brown colouration of beard, hair and iris is most frequent, or he considers that his results establish a relation between the frequency of albinism and "normal melanism." It may be doubted whether this conclusion is justified. Venetia and Emilia with the Marshes head the list of provinces with brown hair, namely in 81 and 80 p.c. of their communes brown hair predominates; but in these two cases the proportions of albinos are respectively 27,000 and 78,000. The data are too slender for any conclusions of this kind, and if the preponderance of males (69 ♂'s to 42 ♀'s) according to Raseri be not sufficient to show that women are less subject to albinism than men, how is it possible to assert that the numbers found for any of the Italian provinces are relatively significant? The results can only be suggestive and the direct connexion between albinism and normal melanism seems far from demonstrated. There is no means of ascertaining the extent to which racial mixture is prevalent in the provinces in which albinism is more frequent. Nor is there any record of the frequency of unmatched eye and hair pigmentation,—both points which are probably more closely associated with the appearance of albinism, than the prevalence of "normal melanism."

This Italian Census after seven years had only produced replies from 540 out

¹ *Censimento della Popolazione del Regno d'Italia*, Vol. v. Roma, 1884, p. 111, Table XXI.

² Twinning appears to be rather frequent in albino stocks, but the above statistics appear to show that twinning is not in itself productive of albinism.

of 8300 communes, and those chiefly rural communes. It applies to scarcely $\frac{1}{10}$ of the total population. Still in this limited range it is not without value and we believe does suffice to emphasise the points¹:

- (a) that the frequency of albinism is about one in 20,000.
- (b) that the male is more liable than the female to albinism.
- (c) that the albino has a considerably lower expectation of life than the non-albinotic.
- (d) that mountainous districts involving endogamy are not a direct cause of albinism.

(xiii) *Greece, Turkey and the Southern Slavs.* We have no material at all.

(xiv) *White Races outside Europe.*

From the United States we have fairly ample material. Pedigrees 36, 114, 193, 195, 304, 401, 412, 593 deal with new material and provide 19 ♂'s, 14 ♀'s and 3 o. Besides these we have 17 published pedigrees, including two Canadian² on our plates. These provide 12 ♂'s, 15 ♀'s and 17 o complete albinos, 1 ♂, 3 ♀'s and 5 o incomplete albinos.

Further Colburn in a paper on Congenital Nystagmus³ mentions three single cases of albinism, a girl of 12 (refraction myopic, amount not given; V. 10/200), a boy of 10 (H. astig. 1.5 D.; V. corrected 20/30) and an unsexed case aged 4 (no particulars). Duane, also in a paper on Nystagmus⁴, gives the case of a young man, aged 26, a "marked albino" ("Fundus at periphery entirely destitute of pigment, giving typical picture of albinotic background. Intermediate zone and central areas normally pigmented, forming red patches which in places are separated by a sharp outline from the adjoining white fundus." Refraction high H. astig., 8 D. and 4 D., V. corrected 20/200 or slightly better). There are probably other cases which have escaped our notice.

Thus altogether we have 93 American albinos of whom 34 are ♂'s, 33 ♀'s and the large proportion of 26 not sexed.

From South America we have only Prof. Lagleyze's seven pedigrees⁵ involving 8 ♂'s, 11 ♀'s and 5 o, with one case of incomplete male albinism, or 25 albinos altogether. The other South American States provide us with no data as to the white races.

We have further albino cases from Fiji⁶ (Australian mother, Scottish father), with 2 ♂'s, 2 ♀'s and 1 o; from New Zealand⁷ 5 ♂'s and 1 ♀; from Pietermaritzburg⁸ 2 ♂; and 2 ♀ cases of mixed descent⁹ the maternal grandmother being a Spanish Jewess and the maternal grandfather Irish. Thus as far as our very slender data goes there appears little reason for supposing that change of environment modifies in any marked manner the extent to which albinism is prevalent in the white races.

¹ These conclusions, especially (b) and (c), do not wholly agree with Raseri's, which Manouvrier (Bibl. No. 376) cites with apparent approval. These anthropologists, however, do not appear to have tested them by any adequate statistical theory.

² Figs. 66, 67, 70—72, 76, 78, 178—9 (Canadian), 217, 250—5, 500.

³ *American Journal of Ophthalmology*, Vol. xiv. p. 243, 1897.

⁴ Bibl. No. 484.

⁵ Figs. 105—111, since engraving the plates, they have been published: see Bibl. No. 552.

⁶ Fig. 369. ⁷ Fig. 373, and two further cases reported by Dr F. Wallace Mackenzie of Wellington.

⁸ Fig. 37.

⁹ Fig. 543.

(xv) *Jewish Albinos.* Our statistics indicate a rather considerable amount of albinism among the Jews. In this case we have to remember (i) that a rufous type of Jew is not uncommon and (ii) that there has been a considerable intercrossing with Christian populations. Unfortunately we have very rarely data to consider the influence of (ii), but the influence of (i) is more obvious. Should it be ultimately demonstrated that a relative large frequency of albinism exists among the Jews, these points would probably repay full inquiry. In Fig. 14 we have a Jewish albino boy aged 12, the only son of Russian Jews from Zanzibar, the father is said to have had "yellowish brown" hair, decidedly fair for his race. In Fig. 49 we have two male albinos and an albino ancestress, a Russian or Roumanian Jewess. In Fig. 212 we have a male albino, whose mother was "half a Jewess¹." In Figs. 300—2 we have three Jewess albino girls and one boy from Algiers. In Fig. 376 a German Jewess albino, whose father was "raven black" and mother "chestnut brown," some of the other children were blonds. In Fig. 571 we have the case of an albino boy born of Jewish parents. In Fig. 568 we have four female and one male albino in a family of Russian Jews who have emigrated to London. This family is marked by a prevalence of blondism, not characteristic, except in the rufous form of pure Jewish extraction. In Fig. 446 we have four male and two female cases of albinism in a Viennese Jewish family, one of these was an incomplete albino, hair always light, eyebrows and lashes rusty colour, fundus albinotic, red reflex, iris shows a greenish colour, which was indicated also in Fig. 49; in this family there appears again to be a certain amount of Jewish blondism. Another (to judge by the name German) Jew, a boy, aged 6, was examined Jan. 3, 1907 at the R. L. Ophthalmic Hospital by Mr Treacher Collins and reported to suffer from incomplete albinism; his hair was the palest straw colour, nystagmus, and refraction high mixed astig. in both eyes², but the irides were "lightly tinted with brownish yellow pigment." Probably a good many of our isolated London cases may also be Jewish, but they have not been especially reported as such. In all, the known cases amount to 23, 12 ♂'s and 11 ♀'s.

(xvi) *Syrian Albinos.* We owe to Dr A. J. Manasseh some remarkably interesting details of Syrian albinotic families. Here again we note the various grades of albinism which occur and to what a large extent the racially unusual blondism is found in the albinotic stocks. From the neighbourhood of Mount Lebanon, Dr Manasseh provides us with linked pedigrees of many albinos from one village and a number of separate independent families³. These give 22 ♂'s, 16 ♀'s and one unsexed with three incomplete albinos 2 ♂'s and 1 ♀, or a total of 24 ♂'s, 17 ♀'s and 1 o. The photographs on Plates *GG* (102) and *NN* (129), (131) bring out characteristic albino features. Of the hair specimens many are pure white, but some tinged with yellow. Dr Manasseh states that it is not uncommon to find the irides a green or yellow tint, which is suggestive of the forms of partial albinism which occur among North American Indians, the Pacific Islanders and even the Jews⁴.

¹ It is well to remind the reader of the importance of recording all racial intercrosses in describing albino pedigrees.

² R.: H. 4 D. horiz., M. 4 D. vert.; L.: H. 4.5 D. horiz., M. 2 D. vert.; too young for visual acuity to be tested.

³ Figs. 591, 597—605.

⁴ See above. The Letts also may be noted as combining this greenish yellow iris with light yellow hair: see our pp. 30—31.

For the rest of Asia Minor as for European Turkey we have no details.

(xvii) *Egypt*. Among the Arab population of Egypt and North Africa we might expect much racial mixture and possibilities for observing numerous skin peculiarities¹. Our plates show (see Plates E and D) that leucoderma is well known in Egypt. Ledyard in his "Remarks on the inhabitants" in 1788 writes of Alexandria:

"I saw to-day an Arab woman white, like the white Indians in the South Sea Islands, Isthmus of Darien, etc. These kind of people all look alike²."

He was clearly not very interested in albinism or he would have known that albinos did not "all look alike." Still we must thank him for one of the earliest references to an Arab albino. Cf. Abdollatiph's case cited on our p. 21.

Sonnini³ at the end of the 18th century saw a case of leucoderma in an inhabitant of Siout in Upper Egypt. In this case it was spreading but without pain or uneasiness. He takes occasion to say that the Arabs call it 'behag' or 'bokák' in the partial stage, but 'barras' when the body has become wholly white. These are not dangerous according to Niebuhr, who terms 'Dsjuddam' or popularly 'Madsjurdam' the most malignant form of leprosy. It would be of some interest to know if 'barras' is used of albinism or only acquired complete leucoderma. In our own pedigrees we have only one from Egypt, which contains three male albinos. The family is a Coptic one. Capt. R. L. V. Foster, R.A.M.C., kindly reported to one of our number that he had recently examined 10,000 men of 21 years of age from the Delta for the Egyptian army. They are examined in a nude condition medically and cases of albinism could not escape detection. He found not a single albino. His colleague who had examined in the same way a similar number of men from Upper Egypt, Cairo to Assuan, saw only one case, that of our Fig. 611, III. 1. If we may take the recruits for the Egyptian army as a sample of the population, the percentage of albinos in modern Egypt is about 1 in 20,000, almost the same ratio as we have found in other regions.

Schweinfurth in his *Heart of Africa* (Chap. XIV, p. 57 trans.) mentions twin albinos, fishermen of Djidda, whom he had seen on the Red Sea, and speaks as if all the characteristics of pronounced albinism were frequent in fair individuals of "the true Semitic stock, either Jew or Arabian."

(xviii) *North Africa*. Baudoin in his *Voyage dans le Bélad-el-Djérid* refers to complete and partial albinos seen by him, some of whom appear to have been Arabs and others negroes⁴.

We have already referred to the occurrence of albinism among the Jews of Algiers as reported by Guyon⁵. Carron du Villards⁶ mentions the case of a young

¹ Rohlf (see Bibl. No. 332, S. 153—4) drew attention in 1874 to the remarkable skin results due to Berber and Negro crosses in North Africa. Thus he especially mentions the Sheik of Tamagrut in Bu-Bekr, who had a spotted skin, the ground being white with small and larger black spots scattered about like islands. He saw others with dark skins and white spots. Some of the blacks had long smooth hair, there were occasionally whites with curly woolly hair. It is clear that these inter-racial crosses lead to marked pigmentational or other segregational effects.

² See Bibl. No. 133, p. 31.

³ See Bibl. No. 132, Orig. p. 75, Trans. p. 67. Sonnini appears largely dependent on Niebuhr, *Description de l'Arabie*, Copenhagen, 1773. See p. 119 and the note by Forskal on p. 120.

⁴ See Bibl. No. 239, p. 177.

⁵ See Figs. 300—2 and Bibl. No. 223.

⁶ See Bibl. No. 218.

Jewess from the "coast of Africa" an albino, who exhibited herself on the Parisian boulevards in company with a piebald from Porto-Rico (un individu tacheté de noir). Furnari¹ in his *Voyage médical dans l'Afrique septentrionale* speaks of albinism among the Jews of Algeria as if it were frequent in 1845, and especially records that the eyebrows and eyelashes instead of being of the pure albino white are frequently marked with red².

Thus among the Semitic races we have evidence of the definite existence of albinism, and some suggestion that it is related to the rufous and blond types of these races.

We may place here the Abyssinians as a mixed stock with a Semite nucleus.

(xix) *Abyssinia*. Tellez in 1660³ first drew attention to the albinos among the Abyssinians. Ludolphus transcribed the passage from Tellez in his *Historia Aethiopica* of 1681⁴: "Color illis est ut plurimum niger, fuscus vel mustellinus, quem illi maximi faciunt; nonnulli etiam rubicundi sunt; pauci albicantes; vel potius pallidi & exsanguis; ingrata prorsus albedine." His comment may be reproduced here from Gent's translation of 1682: "True it is, there are some *Whites* among the *Ethiopians* in other places, but they look like the countenances of Dead Men, or as if they had the Leprosie; which other Authors also Testifie, but write withal, that it proceeds from some Disease in the Body, and therefore other *Ethiopians* avoid being breathed upon, or touched by them, as believing them contagious. Also in the midland parts of *Guiney* there is a Nation consisting all of White People, which are therefore called *Leuc-Ethiopes* or White Ethiopians, and of these the ancient authors make mention."

Ludolphus then says that the Abyssinians like their black better than our white, and on the evidence of Gregory of Abyssinia that they paint the devil white (compare our black devil!) and black children are frightened at white men.

Reminding the reader of the Albanian albinos of the Caucasus mentioned by Isigonus (see our p. 12) we turn now to Asia, having completed our brief survey of Europe and the peoples of the Mediterranean basin.

SECTION II.

Yellow and Red Skinned Races. Asiatics, Polynesians, Australians and Americans.

B. Asia.

(i) *Persia*. Mr E. Treacher Collins in a letter of Sept. 27, 1907, informs us that when travelling in Persia he saw an albino:

"I noticed him several times in the bazaar at Ispahan; he was such a striking feature amongst his dark-haired, dark-skinned fellow countrymen."

¹ See Bibl. No. 239.

² We have received some account of albinism among Portuguese Jews, but it is not sufficiently definite for publication.

³ See Bibl. No. 27, p. 39.

⁴ See Bibl. No. 34, Lib. i. c. 14, 29.

The legend that the Persian Zāl and the great Tamerlane both had very long white hair from their birth appears to be current in some parts of India and the suspicion of albinism has attached itself in the minds of some to these heroes. Professor C. E. Wilson has most kindly sent one of our number the translations of two passages from the *Shāh-nāma* bearing on the eye and hair colour of Zāl :

“His face (is) red like (the flowers of) the Judas tree;
 (He is) young in years, vigilant and of youthful fortune.
 Of faults (he has) only this that (his) hair is white;
 The fault-seeker can find only this (fault).
 The whiteness of his hair is becoming;
 You might say that it fascinates hearts.”

When the poet excuses Zāl's hair in this manner, it is difficult to believe, that its whiteness—here associated with youth—was not felt to be something very anomalous, and condemned by some.

“His eyes (are) like two ‘water-coloured’ narcissi;
 His lips (are) like coral; his cheeks like blood.
 His hair is entirely white in colour,
 Of faults there is only this, and this is not a disgrace.
 The ringlets of that champion of the world over (his) face
 Are like silvern chain-armour over the flowers of the Judas tree.
 You might say it ought to be as it is;
 And if it were not so, love (of him) would not increase.”

The word (*ābgūn*) used for the eyes is literally ‘water-coloured,’ it is commonly applied to iron or steel and it means sometimes ‘blue’ and sometimes ‘lustrous.’ Professor Wilson says that he should translate it here lustrous, as “I think it very improbable that there were blue eyes in Persia among the pure Persians in early times.” But it seems equally improbable that there would be white hair, and the two passages do not read like a description of a dark eyed, dark skinned normal Persian. They appear to suggest at least incomplete albinism, and if a man had white hair in youth, then he almost certainly had unusually light irides, and they may well have been gray, greenish or even real blue, judging from other dark-race cases of such albinism.

While far from pledging ourselves to the albinism of Zāl, we think the above curious lines describing him deserve at least to be recorded when we are touching on albinism in Persia.

(ii) From Afghanistan and Baluchistan we have no data. Cornaz¹ cites Schreber² for a case of albinism from Tobolsk. We have not succeeded in verifying the reference. From Siberia we have only the references to “spotted Tartars” discussed in our chapter on the Albinotic Skin. Thus our information as to northern Asia is extremely meagre.

¹ See Bibl. No. 256, pp. 279 and 284.

² See Bibl. No. 79. Cornaz cites the French Trans. *Hist. nat. des quadrupèdes*, T. I. pp. 14—15.

(iii) *China*. The conditions here are peculiar. It would appear that albinos are looked upon as abnormalities and if not killed, are often sold by their parents.

Dr W. Carnegie Brown who has had large experience of the East writes:

"Chinese albinos are not uncommon. I have seen several in Penang, and have examined one. They were all street-hawkers and all males. They are usually disowned by their relatives, and left to shift for themselves, and they generally take to begging and hawking. The man I examined said he was born an albino in the Hokien province of China. He was sold when a child by his parents, and brought to the Straits to beg; the idea, apparently, being that his condition would excite pity. He had been a beggar all his life; he had got arrested by the police, and for some reason I was sent for to see him at the Police Station. He could give no information about his parentage. His irides were pink, and his hair a very pale yellow, almost white, his skin was quite devoid of pigment. The sun bothered him a great deal. He is still (1905) in all probability going about in Penang. I saw him about three years ago. Albinism is very noticeable in the Chinese, as their hair is invariably black. There is no brown, auburn or red hair among them" (Letter to K. Pearson, April 19, 1905).

Gustav Kreitner writing in 1881¹ reports two Mongolian albino boys:

"Seit dem Ende der mohamedanischen Rebellion in China, die auch die Stämme in der Umgebung des Kuku-nor in wilden Aufruhr gebracht hatte, sind die grasreichen Steppenniederungen im Osten des Sees öde und verlassen. Die Mongolen sind von hier geflohen, und die Tanguten meiden die Nähe der Chinesen..." "Unter den Bergbewohnern findet man hie und da Abnormitäten, die, wie die Chinesen in Sining-fu erzählen, nicht selten auftreten. Ich sah deren in Sining-fu zwei, und zwar Knaben im Alter von 8 und 14 Jahren. Beide, in Grösse und Körperbau ziemlich entwickelt, besaßen hellblondes, der eine beinahe weisses, Haar und blaue Augen. Die Gesichtsfarbe war licht, und stach von der gelben Farbe der Chinesen scharf ab. Die Intelligenz beider Kinder stand jedoch auf tiefster Stufe; sie sprachen ein lallendes Chinesisch, und das blöde Lachen kennzeichnete die Idioten. Die Kinder waren von ihren Vätern, echten Bergtanguten, an die Chinesen in Sining-fu als Sklaven verkauft worden."

Here we see again the same selling of the albino.

Our pedigrees give (Fig. 344) the case of three Chinese albinos at Samarinda, a Dutch town on the east coast of Borneo. There is an albino sweetmeat seller in Tchang, Central China.

Dr G. L. Maxwell, from whom C. H. Usher made inquiries as to albinism in Formosa, writes as follows under date March 3, 1908:

"I have never come across a case of albinism in man in Formosa (I have heard of it in monkeys), and after inquiring of others who have spent many years in Formosa I have still failed to hear of a case. I cannot help thinking that Professor M. is mistaken when he says he met a case in Formosa. I travelled with the Professor a good deal and at Foochow on the mainland we noticed together

¹ See Bibl. No. 375, p. 739.

a case of albinism in a Chinaman, and I cannot but think that it must have been of that man he was thinking. I saw a second case of albinism in Amoy a few months back, but I have never heard of a case in Formosa¹."

Dr G. Preston Maxwell in a letter to E. Nettleship, May 7, 1906, says that he knows of three albinos in the Amoy district. In none of these cases were the parents affected, nor could he hear of any history of a like condition.

Among the Bahnais at Thi-Nai in Cochin China Père Hugon² saw only one case of albinism: "Ce sauvage avait les cheveux blancs, la peau blanc-rosée; son iris n'a pas été examiné. Il avait honte de son état et se montrait peu, mais n'était l'objet d'aucun mauvais traitement, d'aucune superstition."

In Siam we have two female albinos reported by Carl Bock³: "In Chengmai I saw two albinos, both with a light reddish skin, white hair, resembling a very pale glossy hemp, and pink eyes, which they were in the habit of blinking much in the daytime, being unable without difficulty to bear the strong light. These albinos were sisters with a difference of four years between their ages."

To Malaysia we shall return later when dealing with C. H. Usher's special material. It will be seen that while our data are very sparse, and quite insufficient to give any measure of frequency of albinism in China or the neighbouring states, they yet show that albinism is a familiar occurrence in the far East.

(iv) *India*. In our pedigrees will be found a record of 32 ♂'s, 14 ♀'s and 7 not sexed albinos⁴. These are principally Tamils; and probably the fact that the male children go to school accounts largely for the extreme disproportion of the sexes. The families are from Madras, Calcutta, Trichinopoly, Mahé, Malabar, Pondicherry, etc. We have also one published, and two unpublished pedigrees from Ceylon⁵, providing 3 ♂ and 3 ♀ albinos. Besides the above we have fourteen isolated cases, 6 ♂'s and 6 ♀'s with 6 not sexed, in the literature or hitherto unpublished. Thus in two years Dr Owen Berkeley Hill has seen four albinos in India, of whom two were twins in an orphanage at Hyderabad. He has also seen a case of partial albinism in a Mahomedan boy of 7 at Vellore (Letters to K. Pearson, June 25, and August 11, 1909).

Again Dr W. Carnegie Brown reports the case of a Tamil female albino from India,

¹ Dr Maxwell says that the savages, probably Malayan in origin, number perhaps about 150,000—the Chinese are given as 3,000,000, but these include a large number of civilised aborigines, who in the old days submitted to the Chinese and adopted their customs. The marriage laws among this Chinese population are very strict; not only cousins, but persons of the same surname are forbidden to marry, or at any rate such marriages are considered immoral. The savages are divided up into a large number of small tribes and marriage is strictly intertribal. In some cases where the tribes have dwindled down only to a few tens the intermarriage must be very close. This fact is important for our inquiry as to the prevalence of albinism in Formosa.

² See Bibl. No. 355.

³ See Bibl. No. 393.

⁴ Unpublished, Figs. 418, 489, 490; published, Figs. 124—129, 359—361, 443, 522—525, 528. An inconclusive note on the existence of albinos in the "East Indian Peninsula," their dead white European skin and photophobia occurs in *Froriep's Notizen* for 1839: see Bibl. No. 226.

⁵ Figs. 435 and 9, 486. Marshall (1832, see Bibl. No. 199) states that he has "seen a few albinos in Ceylon but they are not numerous on that Island."

whom he saw as an indentured coolie on the estate of the late Mr J. M. Vermont of Batu Kawan, Province of Wellesley, Malay States in 1895. She had come from India to work for a period of three years as a field-worker, and advances had been made for her passage, etc. to her relatives, which were to be deducted from her wages. Mr Vermont was aggrieved because she was useless for work, owing to the glare in the fields hurting her eyes. Dr Brown asked her a good many questions, but found her very stupid. She said she was forty years old, though apparently only twenty, and though such ignorance he has found not unusual, he believed her mentally defective. There was absolutely no pigment in skin, hair or irides, and the condition was congenital.

The case is interesting as it appears to be an instance of an attempt on the part of relatives to free themselves from an encumbrance, of which they were possibly ashamed. As far as it goes it confirms the attitude towards albinos in India reported from other sides.

The Abbé Dubois, a missionary in Mysore, writing¹ in 1817 of *Chakrelas* or albinos observes:

"It has not fallen under my observation to determine whether two of this sort, a male and a female, united together, would have issue, but I am perfectly convinced that they are capable of procreation when they mix with other individuals. A few years ago, a young child was brought to me for baptism, the fruit of a connection between a *chakrela* woman and a European soldier with whom she cohabited. And truly, without the courage and intrepidity of a soldier he could not have encountered so disgusting an object."

Unfortunately the worthy Abbé gives us no information as to the skin-colour of this interesting offspring, but proceeds to tell us of the abhorrence with which albinos are regarded in India. While the story of the Bhut Baby² shows that this prejudice still survives, regard should be paid to the state of affairs indicated in our Figs. 524 and 525.

Deschamps³ in the excellent paper from which our Figs. 359—361 are taken reports two further cases of Mussulman albinos from Mahé on the coast of Malabar, one of these lived on the coast alone about 10 miles south of Mahé, and was difficult to see as he would allow no one to approach him.

Dr Drake Brockman⁴ reported at a meeting of the Ophthalmological Society on Oct. 15, 1896, that he had operated for cataract on a Hindoo albino and that the case progressed well.

Lastly we may refer to the quite sane accounts⁵ of albinos provided by the Danish Evangelical Mission at Tranquebar (Tanjore) as early as 1766. In the first of these accounts (*l.c.* Vol. 4, Pt. 2, p. 1239) a normal native man (from Poreiar in Malabar) and woman had four white children, whose skin-colour was wholly different from that of half-castes,—it was "eine weisse mit rot untermengte Couleur." The hair of their heads was like European goat's hair to the touch, and of peculiar white

¹ See Bibl. No. 159.

² See Bibl. No. 447.

³ See Bibl. No. 441.

⁴ See Bibl. No. 470.

⁵ See Bibl. No. 70.

colour. "Sie sehen trübe aus den Augen, und blinzen immer, weil sie das Licht nicht vertragen können. Das älteste so in die portugiesische Schule geht, kann die Augapfel nicht still halten und also nicht die Buchstaben unterscheiden und es recht zum Lesen bringen." Thus a Scandinavian missionary is reporting the full characters of an albino, photophobia and nystagmus, and of an albino who goes to school and finds it difficult to read, when the great Scandinavian biologist is seeking the albino among cave-dwellers and manlike apes!

The next case reported by these missionaries (*l. c.* Vol. 9, Pt. 2, p. 1283) refers to two children, a brother and sister, born of "ganz schwarzen Eltern," and having several dark siblings. These two were quite white with some yellow spots such as Europeans are accustomed to speak of as freckles ('Sommerflecken'). The later history of these children is of much suggestiveness. The parents determined to free themselves of their offspring¹ partly because they should have on their account to undergo 'Schimpf und Schande' from their 'Geschlecht,' and partly because such births are looked upon as a sure sign given by the gods of misfortune to their family. They therefore sent one child to Tranquebar and sold it at a low price, 'für zwei Pagoden.' It was brought up by Christians in the Portuguese school. The girl was married to a European soldier, and died aged 30 in Tranquebar in 1766. The boy remained unmarried, and of fair intelligence though somewhat slack in religious exercises. He became suddenly ill and went mad, "whether as some held from the bite of a mad dog is not however certain."

An earlier notice (Vol. 9, Pt. 1, p. 637, Sept. 1764) appears to refer to the Poreiar family considered above, it describes a young woman as white as a European with *yellow* hair and blue eyes². It again refers to the fine white goat-like hairs of albinos, but adds "die aber nach und nach ins Rothe fallen"; it describes the eyes as 'himmelblau,' but "schwach und blöde" and unable to bear the light of the sun. It states that many Europeans consider such people as 'Missgeburten' and cites as further examples of them a woman in Poreiar of the weaver caste, a man in Nagapatnam, and an old woman in Jaffa-napatnam. Lastly we may note that the report says that in Malabar the albinos are scornfully said to be of the 'Kalkalatten' caste (elsewhere 'Calcalaken Geschlechter') "weil eine Art Käfer (*scarabei domestici*) allhier diese zwei Farben haben³." This explanation of the origin of *Kakerlak*, not in the piebaldness of any individual, but in the double colour of the stock, is of some interest, and inquiry in Malabar might throw further light on the name⁴.

¹ Elsewhere we are told (*l. c.* Vol. 9, Pt. 2, p. 1283) that the people of Malabar look upon these abnormalities with horror.

² Blumenbach (Bibl. No. 97, p. 347) also states that the albinos of Malabar have white skins but not red pupils.

³ The context seems to show that the "two colours" have reference to a caste in which the parents are black and the offspring white.

⁴ There is a reference at the end of the account to an English surgeon Edmund Chapman, whose account of a white negro had been translated into German at Copenhagen in 1748. His paper appears to refer to cases of albinism in man and animals, and to be very reasonable for that date, but we have not been able to discover original or translation. See our p. 38.

Thus we recognize that for nearly 150 years cases of albinism have been recorded in India. Dr Fraser's photograph of a Tamil albino, Plate Q (51), Major Grayfoot's Mussulman albino children from Dharwar, Plate I I (110), and Sir Allan Perry's excellent photographs of a Singhalese albino¹, Plate P (47) and (48), indicate the general characteristics of albinism in India, and the curiously European aspect of native albinos.

(v) *Albinism in Malaysia and the Pacific.*

The information contained in this section is of threefold origin:

(a) Response on the part of medical men to the letter of inquiry issued by two of our number.

(b) Published accounts of albinos in these districts.

(c) A journey by C. H. Usher with personal observations of albinos especially in British New Guinea and Fiji.

We have heartily to thank the numerous collaborators who have aided with their time, cameras and local knowledge to accumulate this practically unique account of the albinos of the far East. Albinos in this part of the world will be first described collectively, and then their distribution with some particulars of individual cases from their respective localities will be discussed.

General Description of Albinos from Malaysia and the Pacific.

Characters:

The skin in infancy and early childhood is so exceedingly fair that it is very doubtful whether at this time of life the dark-race albino in the Pacific and Malaysia could be distinguished from the albino of light-coloured races by means of the appearance of the skin alone. The skin presents a uniform shade over the whole body, there are no lighter or darker areas. It is smooth. [See Plates, photographs (58), (62) and (63), (57), (60) and (61).] In adult-life the skin not unusually becomes darker so that at this period it has the same shade as, or is a little darker than, a normally pigmented skin of a native of Great Britain. The skin becomes rough and wrinkled, it has a shrivelled appearance, and the natural folds tend in some cases to become exaggerated. Sometimes ulcers form. The skin is often scaly on parts of the body.

The most remarkable appearance as regards the skin, however, is the presence of pigmented spots and pigmented areas of skin. The colour of these varies considerably in different individuals and also in the same individual. The spots are of various shades of brown, often dark brown, sometimes reddish-brown, exceptionally they are black at the centre. The lighter shades of brown and yellow-brown are found in the spots of young adults and children.

¹ We have already referred (see p. 16) to the account of the Seras provided by the ambassadors from Ceylon to Rome and cited by Pliny: "Ipsos vero excedere hominum magnitudinem, rutilis comis, coerulis oculis, oris sono truci, nullo commercio linguae," L. vi. xxiv. (Bibl. No. 6). The reader can judge whether this refers to albinos in Ceylon or not! It has at any rate given rise to albino-myths.

An individual spot varies in size from that of an ordinary freckle to a spot with a diameter of $1\frac{1}{4}$ inches. The most common size is considerably larger than that of freckles seen in this country. [See Plates, photographs (64) and (67), (66) and (69), (65) and (68).] Their shape is roughly circular, but there is a variety of forms, some elongated and some oval. The edge of the spot is well defined, it is frequently irregular, sometimes serrated. The spots are not raised; they are smooth. When sufficiently numerous and large they coalesce to form pigmented areas which may occupy very large parts of the skin, *e.g.* the back, or the extensor surface of a forearm. Such areas are readily seen to be composed of a number of pigmented spots by a paler shade of colour at the edges of the individual spots. These pigmented areas could scarcely be mistaken for patches of normal skin because the pigmentation is not sufficiently uniform. The pigmented spots are distributed irregularly over the body. They are most numerous on the back, chest, face, extensor surface of arms and forearms. The flexor aspects of the arms and thighs are amongst the parts least affected.

Etiology of the pigmented Spots. These have been described by different writers as freckle-like marks, freckles, red spots and pigmented spots. It is improbable that the brown scabs (*croûtes*) scattered over the skins of four New Caledonian albino natives and thought by de Rochas¹ to be due to an exudation from the dermis were of the nature of the spots in question. Thomas Williams thought that the large brown freckle-like marks on the skin of three Fijian albino natives were left by old sun-sores². The presence of an ulcer and scar tissue on the back of a Papuan albino (Case 3) suggested the possibility of a somewhat similar cause for the adjacent pigmentation. In the case of a Fijian albino woman—(Case 43)—Dr Corney was inclined to think that there were two kinds of spots—congenital and acquired (freckles). The former consisted of a few pigmented spots over back, chest and mammae; their diameter was never more than 4 mm.; they were usually oval; outline serrated; colour rich dark walnut or chestnut. The freckles situated on the face, arms and hands were easily distinguished in appearance from the “*maculae*.” If these spots, in this case, are congenital they must be quite exceptional to judge by the different degrees of spotting in relation to age and in relation to protection by clothing seen in our Cases 1 to 16³.

The two most outstanding features as regards these pigmented spots are (1) that they are not present at birth and (2) that they are principally situated on the parts of the skin most exposed to the sun. They originate in early childhood and gradually increase in quantity and size as age advances. In two children three months old there were no spots [Photograph (59) and that of Merone Case 6 not reproduced]. In a child four years of age spots were present on the ears only [Case 10, Photographs (62) and (63)]. In another child of the same age the spots were very small and affected only the back of the neck [Case 8, Photograph (58)]. In a child of six years there were small pigment spots (Case 2). In a child of seven and a half years the spots

¹ See Bibl. No. 277.

² See Bibl. No. 270.

³ For list of these special cases see our p. 62.

occupied the brow and cheeks, but were not present on other parts of the skin [Case 7, Photograph (58)]. In children of eleven and twelve years the spotting was much more marked [Cases 11 and 13, Photographs (62), (63), (60) and (61)]. It is only in adults that the extensive dark pigmentation and the pigmented areas formed by the coalescence of many spots occur. The sun's rays appear to be necessary for the development of the spots, for the parts of the body most exposed to the sun are the parts most affected and the parts, such as the flexor surfaces of the arms, least exposed to the sun, are little or not at all affected. When clothes are worn spots do not form on the protected parts. An albino boy, aged eight years, at school in Suva, who wore clothes and a hat pressed well down over his head had no spots on any part of him [Case 16, Photograph (56)]. The protection of the skin from the sun's rays afforded by the clothing was no doubt the cause of the absence of spots. A similar explanation may be given for the absence of spots on the legs of a Papuan albino in the employ of a trader (Case 4). Other means of protection of certain parts of the body from the sun suggest themselves in individual cases, *e.g.* perhaps the absence of spots from the dorsum of each foot of a Fijian albino [Case 14, Photographs (64) and (67)] was due to the shelter given by the undergrowth¹.

Are the pigmented spots freckles? We are told that freckles are circumscribed spots or patches of pigment of small size, which occur chiefly on the face and hands, that they begin usually in the second decade of life. That they are roundish or irregular in shape, from a pin's head to a split pea in size, and yellowish to yellowish-brown or amber, sepia black, and occasionally greenish in colour. That in bad cases, large dark irregular patches are mixed up with the more numerous small kind. The chief exciting cause is sunlight, direct or diffuse². As far as the clinical aspect of the albino spots is concerned they conform closely to that of freckles; they are, however, usually larger and darker than most freckles. Whatever the anatomical situation of the pigment in the skin at these spots may be shown to be, it is sufficient at present and convenient for clinical description to call them freckles.

Accepting the view that these freckles are caused by exposure to the sun the question arises why it is that albinos in this country do not freckle. In many of them the protection of the skin by clothing is a sufficient explanation as far as most of the body is concerned, but it does not explain the absence of freckles from the face and hands. That the dark-race albinos have more pigment than other albinos seems certain from the darker appearance of their skin, irides and fundus, and from the circumstance that the red pupillary reflex is much less evident. Yet albinos with a considerable quantity of pigment in this country, *e.g.* an adult albino with a red sandy beard³, do not commonly freckle. Is exposure

¹ It is difficult to explain the entire absence of freckles in the case of the albino from Gawa [see our Fig. 541 and Plate GG (101)] an island not far south of the Equator. His age was about 28, and his skin was fully exposed to the sun.

² See Bibl. No. 499. Second edition, p. 398.

³ See our Fig. 45., IV. 11; special inquiry. It must be remembered that only certain normal persons freckle in our own country. The relations of the albinotic to the rufous, and of the latter to freckling, will be discussed later.

to sun in the tropics necessary to give rise to these freckles? A white-race adult female albino living in the tropics had not developed freckles although her face, neck, forearms and most of her arms were frequently exposed to the sun (Case 22, see our Fig. 369, IV. 15). Possibly it is necessary for the production of freckles in albinos that both these factors should be present—a tropical sun and a sufficiency of pigment or of power to produce pigment—or else it may be that the formation of freckles is associated with a racial condition of which we are ignorant; in the latter event a dark-race albino brought up in this country would freckle provided that exposure to a tropical sun was not a necessary adjunct.

Dieffenbach's Maori albino (see our account below) was freckled. Dr A. J. Manasseh writing from Brumana, Beyrout, Syria (27 Nov. '08) speaks of "spots of brownish yellow pigmentation" (?freckles) as seen on the face, neck, forearms and legs of Syrian albinos and says they are more marked in advanced life and appear in patches (see our Fig. 597). Captain Foster speaks of the freckled skin of a Coptic albino (see our Fig. 611). Some albinos north of the tropics therefore freckle, and some few examples, in part cases of incomplete albinism, have been seen in this country (see our Figs. 316, III. 2; 492, IV. 5; 497, IV. 10; 501, V. 16; 535, IV. 18; 565, IV. 38). As a rule it would appear that albinos of dark skinned races freckle and those of white skinned do not.

Hair. The colour of the hair is described as flaxen, a light shade of yellow, yellow-brown, red-brown, light brown, tow-coloured and white. The hair was quite white in a child four years old. In another child of the same age the hair was of a light yellow-brown, the eyelashes were white. In several instances the eyelashes were white where the hair of the head was yellow or yellow-brown. In two infants of three months the hair was light yellow. The hair becomes darker as age advances, although at the same age the hair of one albino may be darker than that of another albino as is seen in the two children, age four, just mentioned. Illustrations of the colour of the hair of these albinos will be found on our Plate κ .

The hair as regards its curly, crinkled, or smooth character does not seem to differ from that of a normal native, neither does the hair differ in quantity.

Eyes. There is *photophobia*. This is well shown in some of the photographs [Photographs (63), (58), (64), and that of Case 6]. *Nystagmus* is present in most cases. Out of sixteen Papuan and Fijian albinos this symptom was present in fifteen. In these fifteen the nystagmus was invariably lateral and in all but one it was constant. In this exceptional case the nystagmus was well marked, lateral and constant during ophthalmoscopic examination although it could not always be made out at other times. In the case in which no nystagmus was detected no ophthalmoscopic examination was made, so that as far as we know nystagmus might have become manifest, as in the previous case, during such examination. *Strabismus* is present in some cases. In the sixteen cases of albinism just referred to, internal strabismus is mentioned twice, once on the left side and once on the right side. In eight cases it is noted as being absent, in one of these [Case 1, Photograph (75)] the photograph of the man indicates a left internal strabismus. There are therefore at least two or three of the sixteen cases that have strabismus.

Nothing abnormal was noticed as regards the *conjunctiva* or sclerotic, except in two cases where there was conjunctivitis. In no case, however, was either the presence or absence of pigment at the limbus recorded.

The colour of the *iris* shows much variation in different cases. It is described as grey, light-grey, greenish-grey, blue-grey, blue, greenish-brown, yellow-brown, pink and sandy. The colour of the iris is sometimes exceedingly difficult to describe in one or two words. This is largely due to there being different colours and shades of colours in an iris, so that it may not always be obvious which colour predominates. (See our Chapter on the Albinotic Eye, and p. 7 above.) For instance in one case (Case 3) the iris is called grey, but “? greenish-brown” is added as it was uncertain what to call the colouring. Possibly there was a grey ground with conspicuous greenish-brown spots on it. It is thus possible for the colour of the same iris to receive different names from different observers under different illuminations. A case in point is one in which the colour of the iris has been described as light blue by one observer and green-grey by another (Case 5). The difficulty is made more intelligible by Staff-Surgeon Lobb's cases. In one (Case 24) the periphery of the iris was blue and the central part green radiating out into the blue; in such a case it might have been named either green or blue. In another of his cases (Case 25) there were yellow rays streaking out into a blue periphery, the periphery predominating.

The *pupils* are circular, equal and contractile to light. The red reflex from the pupil although sometimes seen is not such a marked feature as it is in white-race albinos.

On *ophthalmoscopic examination* we find the media are clear, the fundus is pale and the choroidal vessels are clearly seen. In some at least of the cases the retinal pigment layer and the choroid evidently contain pigment. The impression gained is that taken all together the fundi are not so pale as they are in albinos in this country. No spots or patches of pigment were seen in the fundi of albinos whether the skin was freckled or not.

The *refraction* of the eye was hypermetropic in some instances, myopic in others and in one albino it was hypermetropic in one eye and myopic in the other.

In *physique*, the albinos seen did not compare unfavourably with the normal native. Their *intelligence* appeared to be equal to that of other members of their tribe.

In some cases signs of degeneracy have been recorded in albinotic stocks. Thus abnormal conditions in addition to the defective pigmentation have been seen by Dr Fraser in a Malay female albino infant with supernumerary fingers and toes (Case 28). It is stated by Romilly¹ that New Britain albinos are usually idiots. Some of the relatives of albinos in a Fijian family had club-foot (see our Fig. 389), and of four children of a Pitcairn Island woman, one of whom was an albino, one at least was an epileptic (see Fig. 421). Mr Allardyce's case (Case 45)—a girl—

¹ See Bibl. No. 401.

age seven, was deaf and dumb, which was attributed to measles at the age of 3 or 4 years. He also saw another female adult albino who was dumb (Case 46).

Names. The preceding account refers to the form of albinism which includes only those individuals that are generally known as albinos. The corresponding words for albino with the Fijians, Samoans and Maoris are Rea, Tetea and Korako respectively; in Niuē Island they are called Mahēle, whilst the natives of New Guinea call them "Uro-Uro," *i.e.* white (Finsch). They are termed Onom-Bela in Nias Island (Sumatra)¹. The Malay word for albino is "Orang Valar" (Dr Fraser, Letter, 25 March, 1909).

In this form of albinism there does not appear to be any essential difference between the individuals in one tribe or race and another, but as the number of reported cases is small this statement may require alteration in the future; certainly as regards the Papuan and Fijian albinos there is no marked difference.

Thus freckled albinos have been seen in Fiji, Papua and Java; in New Zealand amongst the Maoris²; in the Ellice Islands³; in the New Hebrides⁴; in Samoa⁵; in Hawaii and in Amboyna (a Dutch East Indian island), where there was at the end of the eighteenth century⁶ a Papuan man, with light hair and a white skin with reddish freckles.

There are also freckled Malay albinos and a freckled Tamil albino (see our Fig. 9). Dr Fraser says, however, that the freckling of the Malay albinos is far less than that of Fijian and Papuan albinos, to judge by the photographs of the latter. We have also evidence of freckled albinos from Nyassaland (see our Fig. 427).

Second Form of Albinism. That a second form exists in which the skin is darker than in the first form and in which nystagmus may or may not be present and where freckling is absent or at any rate not conspicuous is suggested by the following cases:—

In a Papuan boy (Kanai, Case 17), the skin was brown, but of a much lighter shade than the dark skin of his parents. There were no darker or lighter patches on the skin. His hair was light brown, eyelashes brown and the body hair white. The irides were of a light brown colour. His physiognomy resembled that of an albino. There was constant lateral nystagmus. Unfortunately no ophthalmoscopic examination was made so that there is no information as to the pigmentation of the choroid and retina, or the transparency of the media,—except in so far that the corneae were clear and there was no obvious opacity in the pupils.

In a woman (Sanau, Case 18), probably the aunt of Kanai, the skin had a light brown—possibly reddish-brown—colour, much lighter than the skins of the rest of the tribe. The colour was uniform. There was no nystagmus. The fundus oculi was pale. It is said that her skin formerly was even lighter than at present and that her pupils were red.

It seemed remarkable that these two persons should be looked upon and presented as albinos, because they were so dark when compared with white-race

¹ See Bibl. No. 354, p. 145.

² See Bibl. No. 233, p. 9.

³ See Bibl. No. 334.

⁴ See Bibl. No. 496.

⁵ See Bibl. No. 514, Bd. II, p. 41.

⁶ See Bibl. No. 124.

albinos; they were also much darker than the other Papuan albinos. But when it is taken into consideration that Sanau had red pupils in childhood and her fundus is even now pale, that the body hairs of Kanai are white and that he has nystagmus—which may be caused by an albinotic condition of the eye, although this is not proved—and that his physiognomy is characteristic, there are grounds for the belief that both these individuals represent a darker form of albinism¹. The father of Kanai (Pedi) is quite dark; he says that (Baredi) his father, now dead, had nystagmus when young which passed off later, his skin was not dark. Pedi believes that the nystagmus in his son (Kanai) will also pass off when he grows older. The disappearance of the nystagmus in Kanai's grandfather may, perhaps, be explained by diminished amblyopia as a result of development of pigment in the fundus during childhood². At the village of Tureture on the coast 17 miles west from Daru, where Pedi resides, there was at least one native with light brown (? reddish-brown) skin and reddish hair in marked contrast to the other natives³.

D'Albortis⁴ appears to have had doubts as to whether a child of seven or eight years old, whom he saw at Moatta, a village a few miles west of Tureture, but who belonged to the interior, was an albino or not. He concludes that he was not, on the ground that the other albinos he met with in New Guinea were positively white. He says "he certainly was no blacker than myself, burned as I am by the sun; the only difference between us was that his skin was redder. His hair was red." He also saw at the same place a young man so fair that he suspected he must be the result of a cross with a European; he discarded this idea, however, and also "for various reasons" the albino theory. He makes no mention of colour of iris, nystagmus or fundus.

It may possibly be that some of the natives with light-brown skins seen in Fiji, *e.g.* at Waikama village in Gau Island (Case 10), where there are three ordinary albinos, should be classed as albinos of this darker type. It must be remembered, however, that in Fiji there is Tongan blood and that the Tongans have lighter skins than the Fijians⁵.

¹ The reader should remember the xanthous type of Negro: see our section on the Negro below and the "rufous" type of European albino: see our discussion below.

² See Truc, Valude, and Frenkel: *Nouveaux éléments d'ophtalmologie*, p. 628; the point is an open one; see our Chapter on the Albinotic Eye. All forms of nystagmus dating from infancy and due, as in albinism, to imperfect vision, appear to get less marked with increasing age.

³ There are a few very light brown people with red hair in the Taupota district (Rev. John Hunt's Letter, June 13, '08). Dr H. Fraser's case seems to be another of this type: he was a Tamil with skin not much lighter than a normal Tamil, no freckling, *hair reddish brown on head and eyebrows, fair on nape of neck, chin and upper lip*; nystagmus; iris hazel; fundus pigmented so that choroidal vessels were not visible.

⁴ See Bibl. No. 366, Vol. II., p. 200.

⁵ "Confinement to the hut has always the effect of bleaching the skin; and in Fiji, chiefs' daughters are sometimes confined to the house during the daytime for several years in order to lighten their complexion, and so enhance their value in the marriage market" (Lord Amherst of Hackney and Basil Thomson, *The Discovery of the Solomon Islands by Mendaña*, Vol. I. p. 133 ftn.). This bleaching

Piebald Albinos. A case of this description, with a photograph, seen in British New Guinea was published by Seligmann¹. "There was marked symmetry on the two sides of the body. The case was that of a Sinaugolo boy, aged about four years, on whose trunk there was a large white patch; there was another on his forehead reaching on to the hairy scalp where the hairs were white. There were most symmetrical patches just above the elbow on the back of the arm while on both legs there were white areas extending from just above the ankles to the mid-thigh. Dotted about these there were a few small roughly circular areas of normally black skin. There was no family history of albinism of any grade or of any unusual skin condition." His Excellency Judge Murray had a second photograph taken of this case in 1908, some ten years after the first one, but not quite in the same position. There does not appear to be any increase in the relative size of the white patches when a comparison of the two photographs is made. This case is more fully discussed in our Chapter on Piebalds. The natives of Kapa-Kapa near Babaka (Papaka on map), the village where the piebald lives, say that he was born with the white patches. It would be interesting to know whether the fundus of the eye was piebald in this case.

This appears to be the only known piebald in British New Guinea. The piebald people figured by Pratt² in his book could not be found at Hula where they were said to exist, nor had anyone seen them that was asked about them, nor could the author give particulars when requested. In addition to this one case the only other reference found to piebald albinos was in Powell's book on New Britain³, in which he says that he has seen some cases where the albino was piebald, with patches of the light skin intermixed with the natural dark colour, and that the children of these people seldom retain the parents' peculiarity. New Britain (Neu Pommeru) is a large island to the East of German New Guinea. Not as necessarily throwing doubt on these New Britain cases it may be mentioned that the uninitiated have sometimes supposed that freckled albinos are piebald albinos. One or two Papuan cases reported to be piebald, proved on examination to be only freckled albinos.

Beliefs as regards Albinos. Albinos appear to have been regarded, at any rate in former days, as devils by some peoples and as gods by others. In the island of Ovalau (Fiji) the albino members of the family were considered to be products of the devil, whereas the god of certain matagalis in the islands of Kadavu and Batiki (Fiji) is an albino. The Maoris call an albino "korako," while "korakorako" were mythical beings supposed to be white-skinned and looked

process is reported by Mr George M. Murdoch in his notes on the marriage customs of the Gilbert Islanders (MS. 1908). He says that young people of both sexes but principally females prior to marriage were shut up in closed houses, where they got bleached or light skinned, they were never allowed out in the daylight. Necessarily they got light-coloured as time passed and at the end of say two or three months the majority of them were very light in colour. On the occasion of a great feast or dance, they were brought out, and introduced to society, unengaged girls often securing husbands.

¹ See Bibl. No. 496.

² See Bibl. No. 544.

³ See Bibl. No. 386, p. 115.

upon as demons or beings of evil influence¹. On Nias Island (Sumatra) albinos are called devil's children because it is thought that they are the offspring of devil and woman². The Ainu greatly disregard albinos. (Landor.) In Niuē Island albinos (Mahēle) are said to be the offspring of the god Tu. Tu himself was a Mahēle. In Raratonga the light-haired people are supposed to be the descendants of the god Tangaroa³. The Samoans appear to be ashamed of their albino children, if we may judge by the parents who hid away their child⁴. In Amboina albinos were believed to come from women fecundated by an aerolith, whilst in Ceramlaut the morning star was supposed to be their father⁵. Albinos amongst the Malays of the Philippines were called children of the sun⁶. To all appearance the albinos in Papua, Fiji and Java were treated like other members of the family. In Fiji at least one mother seemed very proud of her albino infant offspring. An old Fijian said that in the days of cannibalism an albino would have been eaten just the same as a normal native.

At Nadala, Viti Levu, Fiji, when Vatunitalitalisalayavi (Case 15, Fig. 386, II. 6) the first albino in his tribe was born, it is said that an albino vuga (vugarea) also appeared on the edge of the pond at Nadala. They grew and flourished together and when Vatunitalitalisalayavi died so did the vuga.

The father (III. 5) of three Fijian albino children (Case 41, Fig. 326) attributed the albinism to his wife's violent fits of temper. When one of these fits came on when she was with child, the colour of the child suddenly altered!

List of Cases and Photographs with their Numbers as used in the above Account.

Case 1 (Walloulo), Fig. 347, II. 1, Plate X (74) and (75).	Case 12 (Etonia Bian), Fig. 444, IV. 22, Plate V (65) and (68).
„ 2 (Kerapuna ♀), no photograph: see description, ftn. p. 78.	„ 13 (Siteri), Fig. 385, VIII. 1, Plate T (60) and (61).
„ 3 (Delimilu), Fig. 348, II. 2, Plate X (76).	„ 14 (Isireli), Fig. 334, III. 2, Plate U (64) and (67).
„ 4 (Kila Belama), Fig. 349, III. 3, not reproduced.	„ 15 (Samuela), Fig. 386, IV. 1, Plate U (66) and (69).
„ 5 (Rusiate), Fig. 390, III. 4, Plate S (57).	„ 16 (Misikingi), Fig. 388, IV. 5, Plate S (56).
„ 6 (Mereone), Fig. 333, V. 5, not reproduced.	„ 17 (Kanai), Fig. 345, III. 2, no photograph.
„ 7 (Louisa), Fig. 329 d, V. 8, Plate S (58).	„ 18 (Sanau), Fig. 345, II. 1, no photograph.
„ 8 (Wainikiti), Fig. 329 d, V. 9, Plate S (58).	„ 19 (Japanese ♂ albinos), Fig. 346, III. 1 and 2, no photograph.
„ 9 (Gasagasa), Fig. 329 d, V. 10, Plate S (59).	„ 20 (Java, Bandoeng, ♂ albino), Fig. 338, II. 1, no photograph.
„ 10 (Sera), Fig. 444, V. 4 and IV. 18, Plate T (62) and (63).	„ 21 (Java, Padalarang, ♂ albino), no photograph, see description, p. 65.
„ 11 (Asena), Fig. 444, V. 4 and IV. 18, Plate T (62) and (63).	

¹ Letter (Jan. 1908) from Mr Elsdon Best, Ruatoki.

² See Bibl. No. 354, p. 145.

³ See Bibl. No. 491, p. 166.

⁵ See Bibl. No. 405.

⁴ See under Samoa below.

⁶ See Bibl. No. 422, p. 245.

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| Case 22 (Europeans, at Suva), Fig. 369, no photograph. | Case 30 (Tati, Pilah Tingah, Dr Fraser), Fig. 351, II. 8, Plate R (52) and (54). |
| „ 23 (Japanese ♂ albino, not seen), photograph, Plate R (55). | * * * * |
| „ 24 (Podini. Staff Surgeon Lobb. Ellice Islands), Fig. 354, IV. 3, no photograph. | „ 41 (Family from Nakasaleka, Kadavu), Fig. 326, no photographs. |
| „ 25 (Lamosi. Staff Surgeon Lobb. Ellice Islands), Fig. 354, IV. 9, no photograph. | „ 42 (Sevulosi, Kadavu), Fig. 327, III. 3, no photograph. |
| „ 26 (Malay, Kuala Kubu, ♀ albino, Dr Fraser), Fig. 353, IV. 5, Plate Q (50). | „ 43 (Keleni, Kadavu), Fig. 328, III. 3, no photograph. |
| „ 27 (Malay, Kuala Kubu, ♂ albino, Dr Fraser), Fig. 353, IV. 7, Plate Q (49). | „ 44 (Albinos in village of Manuana, Kadavu), Fig. 335, no photographs. |
| „ 28 (Malay, Kuala Kubu, ♂ albino, 4 months, Dr Fraser), Fig. 353, IV. 10, photograph not reproduced. | „ 45 (Ovalau pedigree), Fig. 389, no photographs. |
| „ 29 (Tiriah, Cheriow, Dr Fraser), Fig. 350, III. 4, Plate R (53) and (54). | „ 46 (Albinos Loraina and Neirou, Vitogo), Fig. 485, Hair Plate κ. |

Description of Cases with no known family history will be found under their respective districts.

Distribution of Albinism in Malaysia and the Pacific.

Malaysia. Albinism occurs both in the Malay Peninsula and the Malay Archipelago. It has been stated that albinism is of rare occurrence in the Malay race, but these statements have been made without any full study of the extensive references to it in early literature and to its frequency here relative to that of other districts¹.

(i) *Federated Malay States.* Dr Henry Fraser of Kuala Lumpur has recently made inquiry concerning the prevalence of albinism in these states. He has sent particulars of 8 ♂ and 7 ♀ albinos, of whom he has seen seven, and sent photographs and pedigrees. See our Figs. 350, 351, 353 and 483. Of these Tiriah and Tati shown on Plate R, (52), (53) and (54) are very characteristic Malay albinos. They come from Kuala Pilah in the State of Sembilan. From a Malay "Kampong" or village some distance from Kuala Kubu in the State of Selangor, we have

¹ Thus Lagleyze in a somewhat superficial treatment of the historical and geographical sides of the subject (see Bibl. No. 552, pp. 12, 15), considers that albinism among the dark races cannot be so frequent as some authors have supposed. He illustrates this by the statement that when the Dutch took possession of Java, the Sultan had three albinos at his court, and it needed four years to find four others to complete the number "fixé par le protocole." Lagleyze cites no authority for the tale. It is told by de Pauw, within five years of the event as follows:

"L'Empereur de Java, qui les Hollandais tiennent en tutelle à Jucatra [Djakakarta?] où ils le laissent jouir de toutes les décorations d'un pouvoir qu'ils lui ont ôté, possédoit en 1761 trois blafards; mais il fit tant d'instances auprès de son maître, le gouverneur de Batavia, pour en avoir encore quelques-uns, qu'on les lui acheta à tout prix dans les isles voisines; et en 1763 on en avoit déjà fourni quatre autres, qui ne s'occupaient qu'à bourrer le tabac dans la pipe de ce prince, à y mettre le feu, à porter des jattes de pilau, à réciter des oraisons, et à rendre tous les petites services qui ne sont pas au-dessus de leurs forces..." (see Bibl. No. 72). To obtain four albinos by purchase in *two*, not four years does not seem to indicate such great rarity as Lagleyze suggests.

further Malay albinos illustrated on Plate Q (49) and (50). Dr Wood reported these cases, and through the kindness of the district officer they were brought into Kuala Kubu. The remaining albinos were found by Dr Fraser in Kuala Kangsar in Perak; photographs sent, but not reproduced: see Fig. 483. Some account of the marriage customs of the "Kampong" will be found under Fig. 353.

Dr John Gimlette of Kelantan, Singapore, has sent particulars of 3 ♂, 5 ♀ and two not sexed Malay albinos.

Thus on the Malay peninsula we are able to report 23 hitherto unpublished cases of albinism.

(ii) *Sumatra*. We have here only one new case to report, but there are several published records of albinos, some of first class interest. Our new case is that of Dolah, a native of Sumatra, seen by Dr Fraser (cf. Fig. 442, II. 2). Dolah was practically a complete albino. Rosenberg¹ found few deformed persons among the southerly inhabitants of Nias, an island off Sumatra, but on the other hand albinos with red hair, white skin (*Körperfarbe*) and red eyes were all the more frequent. They are believed to be the result of the intercourse of terrestrial women with the devil, and are called accordingly devil-children (*Onom-Bela*). They are the sport of young and old. Rosenberg also mentions an albino from Babasetaro in Nias (*l. c.* p. 137). G. Bennett in his book published in 1834² was, perhaps, the first to draw attention to the blue eyed, golden haired type of Malay albino. He writes: "I was much surprised a few days since, while passing a house near the village [Pedir, to the extreme north of Sumatra] to see apparently a European boy, of about six years old, and on examining him closer found his skin of a white colour, thinly scattered over with small light brown patches. On passing the same house again, I made inquiries on the subject and then had the opportunity of seeing two others, who were females, one about 16 and the other an infant just able to run about. They were described as children of native Malay parents, of the usual colour of their race; but we did not see them as they had gone a short way into the country. The children were called Ceté, Theté and Cebreté. They had a plump appearance, flaxen hair, light blue eyes; the boy and young woman were slightly covered with scattered small brown patches, but the infant had not a blemish on its integument. The natives could give no reason for this variety, they looked upon it as curious, but did not seem to regard it as a disease. They have the flat noses of the Malay, but otherwise would be considered as the offspring of Europeans, the skin being in some degree freckled." This albinism of the skin and hair, with apparently no markedly defective sight (Bennett was F.R.C.S. and would almost certainly have recorded any obvious eye defect), is a special characteristic of some albinos of the dark skinned races, and not without significance for racial evolution.

(iii) *Java*. We have already mentioned the custom of the Emperor of Java to have albino attendants at his court, and that in 1763 there were seven such

¹ See Bibl. No. 354, S. 145.

² See Bibl. No. 205, p. 437.

albinos. The population of Java and Madura¹ in 1905 was returned as about 30,000,000. From Java and the adjacent isles albinism has been reported from very early times, and as we have seen it was the district where *Troglodyta* or *Homo nocturnus* was supposed to be indigenous². C. H. Usher in 1907 saw two albino cases, both male, in his ten day visit, and a trader spoke of another albino he had seen seven years before near Garoet. The first of Usher's albinos seen at Bandoeng will be found described in Fig. 338. The second was a male Javanese, age about 12 years, seen at Padalarang. Skin of face blond, with pigment spots like large freckles on it. Skin of hands and legs also blond. His face was broad and nostrils large. Hair, light yellow. Eyes had marked nystagmus; iris certainly contained some pigment. (March, 1907.)

(iv) *Other Islands in Malaysia.*

Bali. We have the case of Soudame rather fully reported by Van Iperen³ in 1778. He and his wife were slaves near Batavia, but he came from Bali. Van Iperen says that the parents were the usual black-brown of the inhabitants of Bali, and that no other albino was known. Soudame's skin was fresh, healthy, reddish and "flesh coloured." Brown-reddish spots (? freckles) appeared when he was grown up. There was a large wen on right, a small one on left cheek. Portions of the lower part of his body were covered with long white hair, the feet alone being without it. In front of the chin no hair, but under it and down neck a heavy beard, which with the hair on the upper part of his body, formed a kind of mat over his chest, it was slightly curly and "vlammende" (? reddish). This hair did not occur in other natives. The hair on the higher parts was dirty white with yellow and red hairs mixed. Van Iperen describes the eyes at length; Soudame had photophobia and nystagmus, there was no black in the pupil only reddish brown (roodachtig bruin). Soudame was clearly a complete Malay albino. Van Iperen recommends the use of green spectacles for such cases. He says that such albinos are called night-men or ourang-outangs and are found in the forests of Java. This point is of some interest as there is no indication that he considered Soudame or these ourang-outangs anything non-human; he even suggests that Soudame may have got his white skin from intra-uterine small-pox. The hairiness of Soudame may also be considered in relation to Bontius' ourang-outang and the extreme hairiness reported of some other albinos: see Wafer's account on our p. 17 and Fig. 592, etc.

A hundred years later R. van Eck reports seeing on more than one occasion a "Kakkerlak" in the Island of Bali, but unlike Van Iperen he contents himself with saying that they were very repulsive³.

Timor. H. O. Forbes⁴ saw a few youths with red hair which was straight in

¹ The legendary history of Madura makes us acquainted with a King, Rasou-Dawa, who had two children, the one *white*, named Kakra-sana, and the other *black* named Krisna: see Bibl. No. 572. Is this an albino legend?

² See our p. 25.

³ See Bibl. No. 368.

⁴ See Bibl. No. 404.

some, curly in others. The eyelashes were red also the hair over the body was reddish, the eyes were blue. There was a little colony of them at Aitúha well known for their peculiar colour of hair and eyes. Earl noticed (*The Native Races of the Indian Archipelago*, 1853, p. 179) amongst the peoples of the tableland above Dilly some natives of a dull yellow colour; the parts exposed to the sun were covered with light brown patches; the hair was straight and thin, and its natural colour reddish or of a dark chestnut brown. There can be little doubt that these rufous individuals correspond more or less closely to the xanthous negro.

Amboina. This is an island to the south of Ceram. We are reaching here the division between Malay and Papuan. Many of the inhabitants are said to come from the volcanic island of Banda (S.E. of Amboina), where there is much intermarriage and much leprosy. An albino was seen at Amboina seven or eight years ago¹. A Papuan albino was seen here by Labillardière in the eighteenth century². In 1667 Kjöping (see our p. 24) reports albinos in Amboina, and gives a few vague details of an albino woman from Ternate.

We have a fuller account in 1724 by François Valentyn in his *Beschryvinge van Amboina*³:

“We find among these islanders a sort of people who are called Kakkerlakken. They are about as fair as a Dutchman, though others look horribly faded, of a dead pale white, especially when one sees them near at hand. They have very yellow, singed looking hair, many freckles (sproeten) on their hands, and at close view they are scaly with wrinkled skin. By day they see with difficulty, being almost half blind, so that their eyes mostly appear to be always pink-eyed⁴; yet they can see very well by night. They have gray where the other islanders have black eyes; and they are even when born of black parents despised by their own nation, even abhorred by them. I knew a King of Hetoe and his brother who were Kakkerlakken,—they had black brothers and sisters and also black children; there were some who were females, but not many were seen. The same sort of people are found in the kingdom of Loango in Africa and elsewhere....They are given this name from certain Indian ‘Schallebyters’, which wither up every year, and are pale and wrinkled from the

¹ Information from a Dutch ship’s captain, who had been 14 years in the Dutch East Indies.

² See Bibl. Nos. 120 and 124, “I saw on my return a white negro, a Papuan man by birth; he had light hair, his skin was white, and marked with reddish freckles like those of Europeans who have red hair; but he was not weak-sighted as is generally the case with other albinos” (1791—2).

³ See Bibl. No. 49, Vol. II. p. 146.

⁴ The passage is obscure, but probably does not refer to pink pupils, but rather to soreness of the eyelids.

⁵ Valentyn (*l.c.* v. III. p. 295) under the heading *Dieren van Amboina* gives a decidedly unpleasant account of this insect:

“Een van de ongemakkelykste Dierkens die den menschen hier veel schade en ongemak toe brengen, zyn de Kakkerlakken—een soort van Schallebyters, die zomtyds met geheele drommen vooral als ’t regenen zal, ’t zy in de Huizen dog voornamentlyk op de Schepen, als met een storm, tegen ’t vallen van den avond voor den dag komen, en dan zeer dom op iemand aanvliegen. Als mens’ nachts legt en slaapt, komen zy ’t eelt iemand van de voeten zoo afknagen, dat het den Lyder zeer kan doen. Zy doen groote schade aan Boeken, Papieren, en Kleederen, en voor al aan die gene, die wat vet, besmund of

beginning. The name is quite rightly given for they always appear as scaly and withered as the "Kakkerlakken of Lazarussen¹."

Ternate. This is one of the Moluccas, and is no doubt the Tharnodo where Kjöping in 1667 reported albinos. Dr G. W. Johnstone of Singapore in a letter to C. H. Usher states that he has visited this island, and that he saw and photographed an albino from the hills. Heusler² says (1790) that Valkenaer mentions "in einem Zusatze S. 359" the case of four albinos born of black parents and having black offspring occurring on this island. The reference is obscure and we have not been able to trace it further. Valkenaer appears to have laid stress on the distinction between the wholly white skin and "Schuppenkrankheit (Kascaro)," which spotted the skins of the dark races with patches. Possibly the original might have matter bearing on the distinction between albinism, congenital piebaldness and leucoderma.

In 1703 the King of Bantam (not far from Batavia in Java) showed the traveller De Bruin³ an albino woman, and asked to what land she belonged. "Zy was grof en dik van lichaem, maer blank en blond van haer. 't Gesicht was heel gezwollen, d'oogen half-toe." De Bruin took her to be a European, a Russian slave; she was, however, from the hills on the islands south-east of Ternate, where De Bruin says they are termed "Kackerlacken," and describes the usual photophobia, and in this case the extreme fatness of the albino. According to De Bruin she was a concubine of the king (een der bywyven), and we have thus another instance of the position of the albino at the courts of the Malay royalties.

Celebes. The population of this island is given as 2,000,000. With the exception of 9500 Chinese and Europeans, they may be regarded as belonging to various Malay stocks. The Bugis and Mangkassars of the South Peninsula are the dominant native race. The "Alfuros," a collective name for the other native tribes, are said to be at a very low grade of culture⁴.

According to information given to C. H. Usher by a native born at Menado, where he had lived for years, there are in that town two albino children born of normally coloured parents; this family is of Philippine origin: see Fig. 337. There are said to be four other albinos at Menado. Dr Alers, Dutch Surgeon-Captain, stationed in Celebes, sends us particulars of 13 albinos from the extreme north of Celebes. See Figs. 419 and 420. In these cases, as well as in others referred to at the same place (Appendix A, p. 68), albinism seems to be closely associated with half castes and interracial unions, whether of Malay with European or with Chinese.

Meyer, also in the north of Celebes in the neighbourhood of Minahassa, says that he often came across fine examples of albinism among the inhabitants⁵.

besmult zyn, want daar byten zy groote gaten in. Dit Dier komt met de Schepen ook wel in 't Vaderland; dog 't is dan als lam en traag—ook bleeker dan anders."

¹ The significance of the "Kakkerlakken of Lazarussen" is not clear.

² See Bibl. No. 119, S. 360.

³ See Bibl. No. 48, p. 380. De Pauw (Bibl. No. 72, Vol. II. p. 14) doubts whether De Bruin is correct in asserting the albino was a concubine of the king, but her apparent repulsiveness is not a valid reason for questioning De Bruin's accuracy. We know of negro chiefs with albino wives.

⁴ *Chambers' Encyclopaedia*, Art. "Celebes."

⁵ See Bibl. No. 330, S. 15.

A male adult albino has been reported at Oena-Oena, an island off the coast of Celebes¹.

Borneo. Boyle² in 1865 (see our Fig. 342) came across several albinos among the Dyaks of this island. Bock³, speaking of the Dyaks of Koetei inhabiting the banks of the Mahakkam and its tributaries above Moeara Pahou, which is the farthest inland Malay village, says they are closely allied to the Malay races. He particularly asked for cripples or monstrosities, but only saw one, "unless I include a couple of albinos, who were light in colour, the skin being rather reddish and very scurvy, peeling off in scales. Their hair was light brown and the eyes gray. I was told that such albinos were not uncommon in Koetei."

Mention has already been made of the two Chinese albinos in the town of Samarinda on the east coast of Dutch Borneo and near the mouth of the river Koetei (see our p. 50).

An albino has also been reported from the Barito basin in British Borneo⁴.

The Philippine Islands. We reach in these islands a district in which we may expect considerable race mixture. Besides the Malay inhabitants, we have the Negritos, who probably belong to the same race as the Papuans of New Guinea⁵; and in addition there has been considerable crossing with Spanish and even other European blood. The earliest notice of a Philippine albino that we have come across occurs in a paper in the *Phil. Trans.* for 1706 by G. J. Camelli on the monsters and monstrosities of the Philippines⁶. He writes: "Albinam, Hispanis albino, vidi Manilae; erat Puella decimus (proles Morenorum parentum, qui coloris sunt fuliginosi, sed capillitio protenso) albidinis extraordinariae & insolitae in admirationem trahentis, & monstruosae, capilli aureoli, solem ad lucem invitè ferens. Causam vulgus non phantasiae sed Lunae influxui tribuit."

We have thus an early notice of the white skinned, brilliant yellow haired and photophobic Malay albino. We must regret that the irides were not recorded.

Andree in 1889⁷ mentioned a communication from Dr Trinidad H. Pardo De Tavera stating that among the Malays of the Philippines there are albinos with white skin and hair like European albinos. Foreman in his book of 1899 on the Philippine Islands writes⁸:

"There are also to be seen in the islands a few types of that class of tropical inhabitant, preternaturally possessed of a white skin and extremely fair hair—sometimes red—known as albinos....Amongst others, I once saw in Negros Island a hapless young albino girl with marble-white skin and very light pink-white hair, who was totally blind in the sunny hours of the day."

At the instance of Dr H. Fraser of the Institute of Medical Research, Kuala Lumpur, Federated Malay States, and of C. H. Usher, the Bureau of Health for the

¹ Informant a Dutch marine officer.

² See Bibl. No. 300, pp. 95–6.

³ See Bibl. No. 371, p. 182.

⁴ See Bibl. No. 456, p. 162.

⁵ Brinton, D. G.: *The American Anthropologist*, Vol. XI., Washington, 1898, p. 295.

⁶ See Bibl. No. 45.

⁷ See Bibl. No. 422, p. 245.

⁸ See Bibl. No. 477, p. 138. The "pink white hair" appears rather difficult of realisation.

Philippine Islands was asked to obtain information with regard to albinos in these islands. The circular used in this inquiry was communicated to Dr V. G. Heiser, Director of Health for the Philippine Islands. He issued it on April 29, 1908, in the name of Dr Fraser, C. H. Usher and Professor F. Starr of Chicago to the medical inspectors and district health officers of the Bureau. On July 2, 1908, as satisfactory responses had not been received, a further circular with a leaflet by Professor Starr was issued¹. This stringent "whip" produced an account of 45 persons, included under a rather wide conception of albinism. Dr Heiser has most kindly forwarded to us a table of these cases, noting that statistically they do not represent the albinism in the Philippines, and that the Bureau will continue the research until it is able to publish a thoroughly reliable table of albinism in the Philippines.

We give first Dr Heiser's general remarks on the data:

"As a result of these circulars, 45 cases of albinism were reported from seven provinces: Albay, 2; Bohol, 11; Ambos Camarines, 5; Ilocos Sur, 5; Manila, 1; Pampanga, 16; Tarlac, 5.

"It is not claimed that the figures presented are correct or approximately correct. The truth is that they are very far from complete. It is not reasonable to suppose that on the island province of Bohol, with a population of 269,223, there are 11 albinos, while in the near-by island province of Cebu, with a population of 653,729, there is not a single albino; though it is probably true that albinism is more prevalent in Bohol than in other provinces, as there is more 'Folk-lore' concerning the condition. The Bohol term for albino is 'bulao' from the Visayan word 'bulauan,' which means gold. Albinos with blond hair and dark skin are called 'buguao' (yellow), and those who are entirely white are known as 'uguis' (decolorized). In this province there is a tradition of a white people, known as Taguibanua (cave dwellers), which once lived in the mountain caves of the island, and the popular belief is that albinos are the result of the mingling of these cave dwellers with the natives².

"By some of the inhabitants it is believed that a few of the Taguibanua still exist, and that whenever one is seen by a pregnant woman an albino child is the result. This latter theory is accepted in the province of Albay, where there also exists a tradition of an ancient white race.

"Another theory that prevails in both of these provinces, and more or less in all other provinces, is that albinism is due to some peculiar phase of the moon at the moment of conception.

"In the provinces around Manila an albino is known as 'Anak Arao,' 'Child of the Sun,' from the belief that the mothers of albino children during pregnancy develop a 'fancy' for gazing on the sun. This theory is also prevalent to some extent in all parts of the Philippines."

¹ In his second circular Dr Heiser states that Professor Starr had discovered 35 well-defined cases in a very limited territorial area in three weeks' time. It is not said whether any of these are covered by the above 45 cases. If they are all cases of complete albinos, albinism must be very frequent in the Islands.

² Thus the troglodyte albino of Linnaeus appears again on the scene!

No.	Sex	Age	Total or partial	Residence	Skin	Hair	Iris		Pupil	Mentality	Constitution, remarks, etc.	Pedigree, Plate LII.
							Colour	Radiation				
1	f	—	t	Libog, Albay	white	deep yellow	pink	pink	pink	—	—	—
2	m	7	t	" "	absolutely white	white	"	"	"	—	—	—
3	m	17	t	Valencia, Bohol	{ thin, delicate, pink and white	decolorated blond	light blue	golden	dark	poor	excellent health, photophobie weak, lymphatic, effeminate, eyes normal, marked double strabismus, farmer, single weak, eyes normal, strabismus, not myopic	613, IV. 3
4	f	—	—	" "	"	{ coarse, un lustrous blond brown	"	"	"	"	weak, eyes normal, strabismus, not myopic	613, IV. 4
5	m	65	p	Dimiao, "	sunburnt, white in parts	black, ashy	gold brown	brown and imper- ceptible	Light blue	average	weak, easily angered, eyes normal, married, farmer	614, IV. 2
6	m	24	p	Tagbilaran, "	Malay	coarse, corn auburn	"	"	blue (!)	poor	strong, content, happy, eyes normal, single	615, III. 1
7	f	35	p	Dimiao, "	sunburnt, white in parts	slightly brown brunette	light blue	light blue	dark	fair	strong, healthy, irascible, eyes normal, married, weaver	616, III. 2
8	f	26	t	Valencia, "	{ thin, delicate, pink and white	{ un lustrous, gold brownish	blue	blue	"	poor	fair, eyes normal, married	—
9	m	24	p	Panglao, "	sunburnt, coarse, thin	auburn brownish	brown	brown	black	"	sickly, weak and nervous, eyes normal, married	617, IV. 1
10	m	—	—	" "	—	fine, auburn	—	—	—	—	—	—
11	m	—	—	" "	—	brown	—	—	—	—	—	—
12	f	—	—	" "	—	old copper	—	—	—	—	—	—
13	m	—	—	Carmen, "	—	dark brown, auburn at ends	—	—	—	—	—	—
14	m	29	p	Iriga, Camarines	{ white patches on chest and elsewhere	{ black, with small blond frontal patch	brown	brown	black	—	no consanguinity of parents	—
15	m	30	t	Lagonoy, "	pink white	cream white	pink	pink	pink	intelligent	no consanguinity, hemp strippers, both good natured robust work- men and single	618, II. 1
16	m	20	t	" "	"	"	reddish brown	reddish brown	reddish brown	dull, apathetic	—	618, II. 2
17	f	9	t	Paracale, "	white	yellowish white	"	"	"	low	—	—
18	f	11	t	" "	"	"	dark	yellow	dark	good	—	—
19	f	30	t	Cabugao, Ilocos Sur	dark pink	almost white, light straw	"	"	"	"	photophobia, no consanguinity of parents	619, II. 7
20	f	25	t	" "	"	"	"	"	"	"	—	619, II. 8
21	m	11	t	" "	fine blond	light brown	greyish brown	greyish brown	"	—	photophobia, father and mother light patches, mother an albino child by first husband	620, II. 1
22	m	6	t	" "	"	"	"	"	"	—	vigorous, parents dark and not related	620, II. 2
23	f	4	t	" "	"	"	blue	blue	"	vigorous	—	620, II. 3
24	f	26	t	Manila, P.I.	white	blond	—	—	—	—	observed by Dr Catanjal in 1894 and 1902, respectively	—
25	f	—	p	Apalit, Pampanga	—	—	pink	pink	pink	—	delicate, photophobia, nystalopia and nystagmus	621, IV. 5
26	f	—	t	Tarlac, Tarlac	—	—	—	—	—	—	delicate, frail, weak, widow, white semicircle round upper part of both cornea	—
27	f	5	t	Angeles, Pampanga	white pinkish	white and shiny	—	—	—	—	semicircle round upper part of both cornea	621, III. 2
28	f	35	p	" "	light	—	—	—	—	—	toe nails blackish	621, IV. 3
29	m	10	t	" "	white, thin	white and fine	—	—	—	—	good habits and healthy, chinese mestiza	622, IV. 2
30	f	40	t	Bacolor, "	" blushing"	blond	blue	blue	dark	—	—	622, V. 1
31	m	22	p	" "	—	black	light blue	light blue	—	—	children of 30	622, V. 1
32	f	16	t	" "	" blushing"	brown ochre	"	"	dark	—	—	622, V. 3
33	f	10	t	" "	"	golden brown	"	"	"	—	—	622, V. 5
34	m	12	t	" "	"	semi-auburn	"	"	"	—	—	622, V. 6
35	m	4	t	" "	pale and dead white	dark gold	"	"	"	—	—	622, V. 7
36	f	1 1/2	t	" "	"	decolorated gold	"	"	"	—	—	622, V. 8
37	m	46	t	S. Fernando, "	characteristic albino, very white	gold blond	"	"	"	—	good habits, good physique, mar- ried, grandparent an English mestizo, single woman	623, IV. 1
38	f	50	—	Guagua, "	—	—	—	—	—	—	only case in family nystagmus lateral, photophobia, born imperforate anus, great- grandfather English mestizo, single	—
39	f	38	t	S. Fernando, "	" blushing"	pale blond	pink	pink	red	—	—	624, V. 1
40	f	8	t	Candaba, "	white	golden	blue	blue	dark	def. mem.	good, myopic, no consanguinity of parents for these siblings	625, II. 1
41	m	5	t	" "	"	"	"	"	"	good	—	625, II. 3
42	m	—	—	Moncada, Tarlac	sunburn white	blond	brick red	brick red	"	below	albinos in this family for three generations	626, I. 1
43	m	—	—	" "	"	"	—	—	"	average	—	626, I. 2
44	f	—	—	" "	"	"	—	—	"	—	—	626, I. 3
45	f	52	t	Camiling, "	"	—	blue	blue	"	good	weak and nervous, married, parents cousins	627, II. 2

It is difficult to understand why some of those included in the Table appear as albinos; certainly several of them ought not to be marked as total albinos. Further, in the original the individuals are marked throughout in a race column as "Filippino" (f.), which is evidently incorrect, as Chinese and English blood are indicated in certain instances and may be suspected in others. Of the 45 cases only 11 are reported with pink, red or brick red irides or pupils, and three cases with brick red irides are said to have dark pupils. It may be doubted whether it has been possible even in the minority of cases to examine ophthalmoscopically the eyes. Fifteen further cases are given as having blue or light blue irides; three as having grayish brown irides. In ten there are no particulars as to the eyes, and in six they are stated to be various shades of gold or brown. In five cases the hair colour is not stated. In two cases it has been given as "black, ashy" (man of 65), and "black" respectively. In the latter case the man's two sisters are marked as total albinos, and he as a partial albino, but no particulars of his skin or eyes are entered. In the former case the claim to albinism appears to rest on the skin, which is "white in parts," so the man is probably a piebald. In general the skin is recorded in 37 cases; in 32 of these it is noted as white or pink; there are three cases of partial skin albinism; the one already referred to; a case in which the skin is white on the chest and the hair is black with small blond patch in frontal region, *i.e.* a "flare," as illustrated in our Plates E to H; and a third one in which the skin is "sunburnt, white in parts," the hair "brunette, slightly brown" and the eyes blue. The remaining two cases in which the skin is described are given as "Malay" and "sunburnt," the eyes being in both cases brown, but the claim to albinism appears to rest on the hair, it being "corn auburn" and "auburn brownish" in the two cases respectively. In the case of the Filippino aged 65 with "black ashy" hair and the one with a "Malay" skin, the pupils are noted as "light blue" and "blue" respectively, although the irides are said to be "gold brown," *i.e.* probably somewhat deficient in pigment for the race.

Of the 11 albinos of whom pink or red pupils or iris is recorded, the hair is stated to be deep yellow (1), white (1), cream white (2), yellowish white (2), white and shiny (1), pale blond (1) and blond (3), thus marking the frequent transition to yellow in albinos of dark skinned races. Of the hair in the remaining 29 recorded cases, the two black haired individuals have already been referred to, the remaining 27 show every shade of blondism from light straw colour, through golden, auburn-brown to brown itself.

Looking at the material as a whole it involves a large number of interesting cases in the bulk of which blondism—as shown by white skin, yellowish hair and blue eyes—has appeared in a dark skinned, black haired, dark eyed population. In the great majority of these cases it amounts to incomplete or partial albinism; in 25 per cent. or under it amounts to complete albinism with the characteristic albinotic eye. We again meet with the contemporaneous appearance of extreme blondism and albinism in a district where there is a mixture of races, none of which are necessarily themselves blond.

If we turn to the hereditary information in this material we must frankly confess

that it is far from satisfactory. We have included all the facts given on Plate LII, but the pedigrees are incomplete and unreliable in many particulars. They have not been used in the reductions of our material. Thus when "all the grandparents" are said to be albinos or "great grandparents albinos," *e.g.* Fig. D or Fig. E, we can only suppose that it refers to blond ancestry. But admitting this as a possibility we see that these blond Filippino types are excellent material for testing laws of reversion and of segregation. It is with the view therefore of inducing further study of such phenomenal blondism that these rough pedigrees are given here. It would not we believe, however, be possible to put these Filippino blonds on one side as having no relation to albinism; in the first place they closely resemble the albinos who have been noted in other Malay and native races, in that the want of pigment in the eyes is not as marked as in the albinos of white races; further the eyes have not usually been subjected to ophthalmoscopic examination, but have obviously been hurriedly and rather superficially recorded; yet in the case of the individuals 21—23 with "grayish brown" irides and "dark" pupils, we are told that they "seem uncomfortable in the light," and in the individuals 19 and 20 with "dark yellow" irides and "dark" pupils it is said that both are rendered uncomfortable by light; and lastly cases 40 and 41 are both credited with blue irides and said to be myopes¹.

On the other hand, while we have a record of two English mestizos, it is hardly conceivable that in all these pedigrees there can be a family history of European blondism. Direct information as to the result of native interracial crossing is wanting, but this is the side from which we should expect light upon the extreme blondism and degree of albinism which appear among dark races.

Other Islands. Before leaving the district where Malay meets Papuan, we may note that Riedel refers in his work of 1886 on the straight and wavy haired races between Celebes and Papua to albinism in several other islands².

On Buru, he says, albinos are seldom observed, but that many cases of vitiligo (? leucoderma) with ichthyosis, both infectious (?), occur (p. 4).

Of Amboina he tells the legend that albinos are persons whose mothers, sleeping in the bush, were impregnated by a falling star (p. 75).

On Serang (Ceram) albinos are very rare (p. 98); on Seranglag (Ceramlaut) he does not say whether they are rare or not, but reports that they are held in respect because their mothers were impregnated at dawn by the morning star (p. 176).

On the Watubela Islands albinos are scarce, but a preference is given to paler children (p. 208); on the Ke (or Kel) Islands albinos are rarely seen (p. 219); in the Aru Archipelago cases of albinism are seldom observed, the only name in use being *palade*, that is, like whites, or as they say "like white Dutch" (p. 250); on Tenimber there was in 1882 only one albino (p. 278); on Babber they are very scarce (p. 335); on the islands Moa and Wetter albinos are unknown (pp. 370—450). This brings us

¹ In seven cases, 3, 4, 5, 6, 7, 8, 9, the eyes are described as "normal," but strabismus occurs in two of these, 3 and 4. Photophobia is directly recorded in three of the pink eyed cases, 2, 27 and 39, and nystagmus in 27 and 39.

² See Bibl. No. 405.

to Timor (see our p. 65 above); between this island and Bali we have no reports as to albinism. It will be seen that Riedel's information is largely of a negative character, and of the actual albinos observed we get no account.

Before we pass to New Guinea and the Pacific, it may be as well to put on record here all we know about albinism in Japan.

Japan. Albinism occurs amongst the Japanese, but is not common. In the year 900 A.D. two albinos, brother and sister, from the province of Kishin, were reported as a curiosity to the Government of that time¹.

The result of inquiry made by one of us from a few medical men in Kobe, Kyoto and Tokio as to the occurrence of albinism in the Japanese also leads us to believe that albinos are uncommon. In 150,000 cases of eye disease examined during a period of 20 years Professor Komoto (Tokio) had seen only four albinos, two men and two women. One of the former is described in our Fig. 633. A photograph of a male albino was kindly given by Professor Komoto and is reproduced Plate R (55). Professor Komoto further gave permission for the examination of a third male albino who happened to be in his ward on the day of C. H. Usher's visit. This man was aged 20, blond skin, physiognomy characteristically Japanese. The hair had a reddish brown colour and was unusually dark for that of an albino. The iris also was remarkably dark (from memory, brownish yellow). The fundus oculi on the contrary was pale, considerably lighter than might have been expected when the iris and hair pigmentation were considered. There was marked constant lateral nystagmus and photophobia.

Professor Oyasaka (Kyoto) finds that albinism is rare amongst the Japanese. In five years he has seen only two albinos. Dr Ito (Kyoto) says albinos are scarce. He remembered a family near Osaka. There were two male albinos. The parents were not cousins. The grandparents were not albinos. He did not know that any of the relatives were albinos. Dr R. S. Miller (Kobe) had not seen a single Japanese albino in 16 years.

As regards the Ainu, Landor says "albinism is very uncommon among the Ainu. I do not know of any case where it has been transmitted, as albinos are greatly disregarded by the Ainu, and, I was told, seldom marry²."

Melanesians. Under this heading we include the inhabitants of New Guinea, New Britain (Neu-Pommern), New Ireland (Neu-Mecklenburg), Trobriand Islands, Woodlark Island, Solomon Islands, New Hebrides, New Caledonia and Fiji.

The earliest general notice of albinism among the Papuans occurs in Argensola's *Conquista de las Islas Malucas* of 1609³: "Among this very black people (the Papuans to the East of the Molucca) are to be found some who are as white and blond as the Germans. They have eyes so feeble and delicate that they cannot look at the sun without being blinded by it. We name them in Spanish albinos, because of their whiteness. Although they usually have eyes as feeble as has just been said, there exist some who have better eyes than the others, and who are capable of looking at all objects. There are also among the Papuans many deaf individuals."

¹ Komoto; see Bibl. No. 556.

² See Bibl. No. 442.

³ See Bibl. No. 21, p. 148.

It is interesting to find in this passage, one of the earliest in which the word albino is used, the distinction already made between complete albinism affecting the sight and incomplete albinism hardly affecting the sight, which is so characteristic of the dark races.

New Guinea. Most of the interior of this, the largest island in the world except Australia, is still unknown. We consider the Dutch, German and British districts in order. A rough estimate of the population has been made at 650,000¹.

Western or Dutch New Guinea. At Hatam D'Albertis² in 1872 saw two albinos: "A greater surprise was, however, in store for me. Presently a man walked in as the others had done armed and adorned with flowers and necklaces but accompanied by a son of almost 25 and a daughter of about 20, both albinos. Their hair is whitey-brown, their eyes blue and their skin white like that of Europeans" (see our Fig. 358).

D'Albertis saw a third albino, a female, equally white, with red hair and light eyes in the Arfak hills by Port Dorey.

A. B. Meyer³ saw an albino girl, whose father also came from Hatam (3500 feet high) in the Arfak mountains and who had an albino brother (see our Fig. 440). It is possible, but not certain, that this was D'Albertis' case. His paper is published in 1874, and he describes her as a well developed girl of 16. The skin was rose white as that of a female European, but with many light yellow pigment spots ("Sommer-sprossen"). The hair reddish blond, the iris blue and there was marked nystagmus. She bent her head always downwards and shaded her eyes. "Es machte einen durchaus eigenthümlichen und nicht angenehmen Eindruck, ein junges, ausgewachsenes Mädchen mit der Hautfarbe einer Europäerin ganz nackt, nur die Schamtheile eben bedeckt, umherlaufen zu sehen. Die vollbusige Schöne war in der Blüthe ihrer Jugend und stark umworben von Freiern, hatte aber bis dahin alle Anbietungen ausgeschlagen." The natives appeared to like the strong contrast of her skin against their own and to have no repulsion to it. Her features were ugly according to European standards, owing to the flatness of her nose and breadth of her mouth, but with the great variety of features found in Europe she would scarcely have attracted any special attention there. A repulsive feeling was produced by the dirt on her skin, which is usually hidden by the dark skin of the Papuans⁴. Meyer considers that as he saw no more albinos anywhere else in New Guinea, they are scarce there, especially compared with Celebes, where he often met with them.

Forbes in 1882 saw an albino woman with fair skin and yellowish hair in Dutch New Guinea, on the western point of the southern boundary of McClure inlet⁵.

¹ *Chambers' Encyclopaedia*.

² See Bibl. No. 322 and No. 366, 1880, Vol. I. p. 108.

³ See Bibl. No. 330.

⁴ Meyer says the Papuans of New Guinea are darker than the Malays and less dark than the negroes. There is much variation, however, in colour, and this is influenced by exposure to the sun, even in the case of the same individual. At the east end of the Island there is a "copper race," possibly due to mixture with Polynesians, or even to the presence of the latter only. Everywhere in New Guinea occur light brown and even yellow individuals, especially among the women who live much in the huts. The Papuans are not to be called black, but black brown (*l.c.* p. 14).

⁵ Forbes, H. O., *A Naturalist's Wanderings in the Eastern Archipelago*, London, 1885, p. 300.

A Papuan albino, a Dutchman's slave, met with at the end of the eighteenth century in Amboina, has already been noticed (p. 66). He had light hair; his skin was white and marked with reddish freckles like those of Europeans with red hair; but "he was not weak-sighted, as is generally the case with other albinos¹."

*German New Guinea*². Finsch³, who has considered at some length albinism among the Papuans, meeting with natives with as light a skin colouring as Europeans, wrote of them as "white Papuans," and not albinos, because he found the chief characteristic of albinos, namely, red pupils, was absent; they were not blind by day, and could see perfectly well. "Any mention of mixture of white blood with any of these individuals may be put on one side. I only met with one half-breed, and she was easily recognised. The fair straight hair of these white Papuans, which doubtless belongs to the character of albinism, had nothing to do with any mixture with white blood, since such hair is often found among pure dark Papuans. I may mention that the natives pay no special attention to these white individuals, although the skin-colouring of a white man is always an object of attention and admiration....They call these people *uro-uro*, i.e. white, and feel no contempt for them, nor have they any superstition regarding them" (1883).

Later Finsch apparently admitted that the matter is only one of degree, and spoke of these "white Papuans" as albinos. He had meanwhile become acquainted with the fact that this blondism passes insensibly into the albinism in which the eyes are affected. Thus he writes of German New Guinea in 1888⁴:

"The men of Caprivi were in general fairly good-looking people, but pure Papuans, mostly as dark as those of New Britain (between Nos. 28 and 29 of the colour scale of Broca), sometimes lighter. But I had again the pleasure of becoming acquainted with an albino. With the exception of his breast and shoulders, which were much reddened by the sun, his colour was as light as that of a European (Nos. 23 to 25 of Broca); his hair blond, but his light-shunning eyes could not bear the sun as is the case with most albinos."

In New Britain (now Neu-Pommern!) Romilly⁵ in 1886 reports that albinos are common: "They have light blue or pink eyes and in the daylight are almost blind." W. Powell⁶ in 1883 had also seen an albino woman in the Gazelle Peninsula of the same island:

"A little further along the S. end of the peninsula and immediately under the S. Daughter is a small indentation in the coast...which is called Albino Bay on account of a false report of there being a white woman on the shore there. She turned out to be an albino woman; these persons are not uncommon in the South Seas, being not unlike a white person except that the skin appears much pinker and has an unhealthy look. I have seen some cases, where the albino was piebald, with patches

¹ See Bibl. No. 124.

² Sir William McGregor, formerly Governor of British New Guinea, informed C. H. Usher that he had seen albinos there, and once had a freckled Papuan albino servant, long since dead. He had been 600 miles up the Fly River to the junction of the Dutch, German and British territories, seeing many thousand natives, but he had not met an albino on that trip.

³ See Bibl. No. 388.

⁴ See Bibl. No. 418, S. 320.

⁵ See Bibl. No. 401.

⁶ See Bibl. No. 386.

of the light skin intermixed with the natural dark colour. The children of these people seldom retain the parents' peculiarity, but have the ordinary dark skin of their race."

In New Ireland (now Neu-Mecklenburg!) Strauch¹ reported seeing in 1875 an albino with tolerably light, dirty white yellow (ziemlich heller schmutzig weiss-gelber) skin colour and blue iris. The hair colour appeared to be light red, but this, Strauch thinks, is not certain, "as the hair allows itself to be altered by colouring." "At first, from on board ship, one thought to have before one a member of the Caucasian race."

Zoeller², in his work on German New Guinea, 1891, asserts that albinism is much less frequent there than in Africa. He had only seen two, of whom he gives no details. He adds: "Auch die durch Krankheit hervorgerufene stellenweise Entfärbung der Haut—solche Menschen gleichen hierin buntgescheckten Kühen—ist, obwohl häufiger als der Albinismus, doch viel seltener als die gleiche Krankheit in Afrika." Zoeller does not say whether he is referring to leucoderma, and there is a possibility that he may be confusing leucoderma with the pigment patches and freckles characteristic of so many Papuan albinos³.

V. Schleinitz⁴ in 1877 refers to albinos, with flesh-coloured skin, yellow-red hair and light eyes, in the Bismarck Archipelago.

British New Guinea. Population 350,000. Here our material is far more ample. In 1876 Stour⁵, in his description of the natives of Port Moresby and neighbourhood, writes of the Kerapuno, a tribe near Hood Point: "I have seen an albino among this people as fair as any European." Turner⁶ about the same time saw two albinos at Hood Point, a man and a boy. They were typical specimens, having light hair, weak eyes and ulcerated skin. They were naked, like other natives, and presented a curious contrast to their copper-coloured brethren. Turner considers that the Motu in this part of New Guinea differ from the Papuans or Negrito race, which inhabit New Guinea to the West. The hair, especially at Hood Point, is brown-black and not jet-black; sometimes in children it is a sandy colour, growing dark with age. This suggests a racial boundary about this district of New Guinea, where albinism is relatively frequent.

Next in order of time comes the visit of Finsch⁷. He has described, in 1883, four New Guinea albinos: (1) Kwarinam, of Hula, Hood's Bay, one of the speckled albinos with yellow hair and normal sight⁸; compare our Fig. 362. (2) A second male albino, strongly-built, 28—30 years old, from same village. He had dark freckles but was far less speckled and blind of one eye, the other eye saw perfectly in sunlight. (3) and (4) two albino children, ♀ and ♂, from Alt Hula, belonging to the large village Kerepunu in Hood's Bay; see our Fig. 363. The eyes were yellowish brown, fair

¹ See Bibl. No. 346, p. 93.

² See Bibl. No. 605, p. 223.

³ Goldie in 1876 observed two albino boys in German New Guinea, they were covered with sores and their eyes extremely weak. See Bibl. No. 340.

⁴ See Bibl. No. 347, S. 249.

⁵ See Bibl. No. 341.

⁶ See Bibl. No. 349, p. 474.

⁷ See Bibl. No. 388, S. 205.

⁸ According to Finsch these albinos were not photophobic and could see perfectly well.

hair and few freckles ; skin would enable them to pass as European children. Finsch saw in 1884—5 a fifth albino at East Cape¹, (5) “He was as fair as a European, with red cheeks and lips, had red-brown hair teased over into a great cloud, and brown eyes, by no means shy of the light like those of most albinos.”

Seligmann was the next visitor to this district who reported albinos, namely in 1898. He asserted that albinism among the Melanesian or Polynesian populations differed from European albinism in that “the choroid is never pink and the hair is more or less tow coloured, the skin varies from a pink-white colour to that of *café au lait*, while the eye is generally greenish, hazel, or brown. The hair is no finer or silkier than in the normal Papuan, and being frizzly, keeps strictly to the racial type except as regards colour. With a light greenish eye there is usually associated a pinkish-white skin, certainly pinker where unexposed than that of the normal North European. The obvious expedient of calling this condition ‘incomplete albinism’ or ‘partial albinism’ has been avoided, since the latter term has already been applied by Ziemssen, Crocker and others to those cases in which there is congenitally a complete absence of pigment over more or less limited areas of the body, and which can only be distinguished from the far commoner leucoderma by their congenital history².”

This passage possibly requires some criticism. Partial and incomplete albinism are not the same thing, and the condition described by Seligmann or Finsch is very properly described—as originally by St Hilaire (see our p. 8)—as “incomplete” or “imperfect” albinism. None the less, one is very apt to write the term “partial albinism” when one means “incomplete albinism.” In the next place this incomplete albinism is not confined to Melanesians or Polynesians. It occurs with all dark-skinned races, especially among negroes in almost every grade, and, with possibly, but not yet demonstrably, a rather less frequency, among Europeans³. Further, Finsch in Caprivi, Meyer in Dutch New Guinea, and Romilly in New Britain met Papuan albinos with characteristic albinotic eyes. Seligmann further reports an absence of “nystagmus and jerky movements of the eyes” in all the cases of albinism he saw in New Guinea. Usher, who had the opportunity of making an ophthalmoscopic examination of the eyes on some of the same and on other albinos, reports nystagmus and other albinotic eye characters. We think it must be concluded that the Melanesian albinos do not differ essentially from those of other races ; various grades of albinism occur there as elsewhere ; the less complete grades are far more conspicuous than among the blond races. They may be more frequent, but the distinction is one of degree and not of quality. Seligmann saw several albinos further west in British New Guinea than any previously reported, thus he saw two albinotic individuals, Aker and Sergi, at Yam in Torres Straits, who will be found described in

¹ See Bibl. No. 418, S. 240. This small village was not far from Bentley Bay and Point Excellent.

² See Bibl. No. 496, p. 803.

³ We have several cases of congenital white skin and hair in Europeans with normal or imperfectly albinotic eyes. Dr Meyerhof has kindly sent us particulars of two Friesian boys born of blond parents, with quite white hair, white skin, and clear blue eyes ; one with apparently quite normal sight and the other with excellent sight after an operation for zonular cataract.

our Fig. 425. He further saw at Bulaa (?=Hula of Finsch and Usher) an albino boy named Kilapelama, aged about ten. This, to judge by photographs, is the Kela Belama of Hula, seen by Usher in 1907, and described below. Two further points may be noticed from Seligmann's memoir. He remarks :

"There exists also a somewhat less-marked type of albinism in which greenish eyes and tow-coloured hair accompany skin of a pale *café au lait* colour. Two examples of this condition were seen at Jokea, in the persons of a boy about 18 years of age and his paternal uncle. They were both lean, muscular, active and energetic, and the boy was of rather unusual intelligence. Neither suffered from photophobia to any marked degree, nor was the skin harsh or thickened to the touch. This form would seem to denote a transition to those individuals not uncommon among the Papuans of Torres Straits in whom the skin is a shade or two lighter than is normally the case, their eyes being brownish and distinctly lighter than the normal dark colour. Their hair, too, is less dark, and in the men this may be specially obvious in regard to their moustaches. The condition tends to be hereditary; all the children born to a Mabuiag couple, both members of which were of this type, were especially light coloured."

Clearly we have here in the Papuans, as we have found in the Malays and we shall find later in the Negroes, a wide range of albinism passing into xanthism and the merely blond condition. The greenish eyes and tow-coloured hair should be considered in relation to the same characters which Virchow considered as partially albinotic in the Lets. The last point we have to notice from Seligmann's very interesting paper is the partially albinotic boy, whose case we illustrate and discuss at length elsewhere in this monograph.

Between Seligmann and Usher, Pratt in 1906 writes of a "piebald" tribe, the "Motu-Motu people of Hood's Bay," and states that they are one of the mysteries of New Guinea, and that their origin is unexplained. There is no scientific evidence of the existence of any such people. Pratt gives a picture of two natives with large spots, fairly evenly shaped, over their bodies. He possibly came across some of the spotted or freckled albinos such as we reproduce on Plate X.

One of our number, C. H. Usher, visiting New Guinea in 1907, examined six albinos along the South coast at Port Moresby, Kerepunu, Hula and Daru. These are Usher's Cases 1, 2, 3, 4, 17 and 18 (see our p. 62) and are fully described under Figs. 347, 348, 349, and 345, Case 2 excepted, which is given below¹. If the reader will examine the account given of the eyes of these six cases, he will note :

Case (1). Walloulo². Constant lateral nystagmus, photophobia, fundi pale not patchy, myopia. Irides grey.

¹ Case 2. Female albino, aged 6. Skin fair, darker than average British. Small brown spots of pigment on skin. Arms tattooed. Hair yellow brown, eyelashes and brows of same colour. Eyes: pupils equal, large and contract to light. Constant lateral nystagmus. Irides greenish-brown. Ophthalmoscopic examination: fundi pale, no patches of pigment. Choroidal vessels conspicuous. Pigment appeared to be present in both choroid and retina. Examination in feeble artificial light.

² Names of individuals and place names can only be spelt phonetically, and differ from source to source.

Case (2). Female child. Constant lateral nystagmus, fundi pale, choroidal vessels conspicuous. Pigment in choroid and retina. Irides greenish-brown.

	1882	1896	1898	1907	Our pedigrees, etc.
	Finsch	Native woman ¹	Seligmann	Usher	
1.	♂ 28—30 ² Hula one blind eye	♂ adult <i>Delai</i> near Hula	♂ adult Bulaa lost one eye	♂ 45 <i>Delimilu</i> Hula shrunk eye	Fig. 348, II. 2, Plate X (76)
2.	♂ 30—32 <i>Kwarinam</i> Hula	♂ adult <i>Warinama</i> near Hula			see our p. 76
3.	♂ 5 Alt Hula ³ strabismus	♂ boy Kerepunu		♂ adult <i>Walloulo</i> ⁴ Bulla close to Kerepunu internal strabismus (L)	Fig. 347, Plate X (74) and (75)
4.	♀ 9 Alt Hula	♀ girl Kerepunu		♀ died at 20 Kerepunu	Fig. 348, II. 1
5.		♂ adult near Hula	♂ 10 <i>Kilapelama</i> Bulaa (photo)	♂ adult <i>Kila Belama</i> Hula (photo)	Fig. 349. Photo- graph as adult (not reproduced) but like Seligmann's
6. 7.		♂ adult <i>Kielakapa</i> Hula (father of informant)	Fig. 424, I. 2	sex ? child <i>Delimilu's</i> child Hula	Fig. 348, III. 1
8.		♀ girl Kapakapa			—
9.				♀ 6 Kerepunu	see Case (2) our p. 78 ftn.

¹ This woman formerly lived in Hula, but has not been there for 12 years. She is a daughter of Kielakapa and gave the information in 1908.

² Too much weight must not be given to the reported ages of these cases.

³ Finsch says that Alt Hula belonging to the large village of Kerepunu was inhabited by Hula people who settled there before the destruction of the village.

⁴ Seen at Port Moresby. Bulla was understood to be near Kerepunu and, perhaps, not the same as Hula.

Case (3). Delimilu. Constant lateral nystagmus, photophobia, fundus pale, myopia. Iris grey (?greenish-brown).

Case (4). Kila Belama. Constant lateral nystagmus, fundi pale, choroidal vessels conspicuous, no patches of pigment. Right eye myopic, left eye hypermetropic.

Case (17). Kanai. Constant lateral nystagmus (no ophthalmoscopic examination). Irides light brown.

Case (18). Sanai. No nystagmus, fundi pale, hypermetropia. Formerly pupils red.

It follows therefore that we cannot suppose with Finsch or Seligmann that albinism does not affect the sight of Papuans; at most it may do so to a lesser extent than in some European cases.

As some of the albinos on the South coast of British Papua, from Kapakapa to Kerepunu, may be the same individuals reported by different observers, a table has been given (p. 79) to place in line possible identities.

Usher was able during his visit in 1907 to interest a number of local Europeans in albinism, and our pages show reports and histories of further New Guinea and Papuan cases.

Dr W. M. Strong has seen albinos at Orakola, Meceo and Manumanu (? west of Kerepunu), and also a female albino in the Mafula district.

From Turituri, west of Daru, to Samarai, at the extreme south-east corner of New Guinea, no other albinos were heard of, although inquiries were made of missionaries, traders, officials, and others.

In the district west of East Cape, between Awaiama and Dogura, five albinos, two ♂, two ♀, and one o, are reported (1908) by the Rev. Copland King and the Rev. John Hunt, of the Anglican Mission. Three other albinos, one ♂ and two ♀, had been known in the same district, but are now dead. It is believed that there are at present no other albinos there, and that these eight represent the albinos of the district for the last 20 years. There are also a few very light brown people with red hair in different parts of the same district. The details, so far as transmitted, are provided in Figs. 422, 423 and 569¹. The missionaries say that half-caste children are absolutely unknown, except in three cases where South Sea Islanders connected with the Mission have married New Guinea girls, and out of the three only one is married to a local girl. In the above instances of albinism it is almost certain that there has been no intercourse with whites. Cousin marriages are unknown among the coast people on the North-East coast of the Territory in which these cases occur.

In the Trobriand Islands (British) off the South-East end of New Guinea, there is an albino boy with a normally coloured mother, to judge solely from a photograph on a postcard, entitled "Trobriand mother and albino son."

¹ The villages and names of these albinos are as follows: at Wanahari village at Taupota: ♂ Kamatia (ob.), ♀ Waidemani, ♀ Dadikoi (ob.); at Porimutuna village at Taupota: ♂ Kavukavu, ♀ name?; at Awoia (six miles from Taupota); ♀ Goomeia (ob.), ♂ Drinda, o? Uridi. These villages are west of Bentley Bay and Point Excellent, and not far from where Finsch saw an albino in 1884-5; see our p. 76.

From Woodlark and Gawa Islands we owe to Mr John Taaffe excellent notes and photographs of cases as well as a record of marriage customs. These islands are slightly East of the Trobriand group and under the Papuan administration. From Woodlark Island we have our Fig. 417, with the albino girl Bodowa illustrated on Plates V and W (71)—(73). Since that account was written Mr Taaffe has informed us that the pupils have a dark reddish grey colour, and that she shades her eyes with her hands. She has always been a healthy child physically and mentally. On the Plate κ of hair samples, her's is given as S_3 .

On the small island of Gawa there are two albinos, and a third on the adjacent island of Kitava; one of them on Gawa, Okatara, is described Fig. 541, Plate GG (101), and hair Plate κ , S_1 . Okatara's normal brothers and sisters are all married. He could not get any girl to marry him; most of them say they would not marry him because he cannot see well enough in daylight to make a garden. His skin is not freckled, and is white with pinkish hue, although exposed to the sun. Pupils, as in Bodowa's case, are of a dark reddish grey colour. He is sound and strong (see measurements, Fig. 541), has always had good health, and is in no way inferior to the other natives. He is said to have been the first albino ever born on Gawa¹.

On Woodlark and Gawa Islands there is no special name for albino. They simply say that an albino is of a white colour = *Popakou*. They call white men *Gimesēpu*. On the Trobriand Islands there appears also to be no name for albino; white is *Pwapwakan* and white man is *Gomanuma*. On Lachlan Islands, 40 miles East of Woodlark Island, they have also no name, but white is *papao*; white men *Guminumu*. At Koiari Goto, inland of the Port Moresby district, an albino is called *Gifoka*, white *kaiva*, white man *Atakaiva*. At Koita Ga, the nearest portion of the Port Moresby district, an albino is called *Ataerekakereka*, white *kaedauri*, and white men *Atakai*².

Solomon Islands (British). The population is stated on a rough estimate to be not less than 150,000 (*Colonial Reports, British Solomon Islands*, 1905), but it is not possible to state with anything like accuracy the number of natives. "The Solomon Islands are still among the unexplored portions of the globe, though the greater part of the coast line has been visited by Europeans." There are islands of whose interior scarce anything is known. "Malaita, one of the group, is still unsafe

¹ Mr Taaffe tells us that on Woodlark Island there are seven tribes, Flying Fox, Hawk, Cockatoo, Blue Pigeon, etc., and that the many surrounding islands have the same tribes. There is no marriage ceremony, but the inhabitants make simple arrangements to live together as man and wife. They live in villages and cultivate the land in common and practise communism within the village. A child belongs to its mother's tribe and may not marry a member of it, but they may marry a member of their father's tribe. The children of brother and sister never marry each other, nor do children of two brothers or two sisters intermarry as they regard their father's brothers and their mother's sisters each as father and mother and always call them so, *i.e.* uncles are called father and aunts mother. The families are small, four to five children on the average. They age prematurely, probably owing to the malarious climate, to filariasis, and exposure in the nude state to the weather. They are of brown skin, some darker than others. Ringworm of body, face and extremities, to which many of them are subject, obscures the pigment and gives them a fawn coloured appearance.

² Letter from Mr John Taaffe 18 Sept. 1908 (Woodlark Island).

for Europeans to land on, or to explore except in strong parties¹." The population of Savo, where albinos exist, is extremely mixed in the case of both natives and whites².

In the account of the discovery of the islands by Mendaña in 1568, there is nothing which makes it at all certain that the Spaniards saw cases of albinism among the natives. Yet they say that "a few are quite fair, these being they who never leave their houses, or young boys," and, again, some dye the hair a light colour, some are naturally fair. "They saw among the natives...some white, fair-haired and well-featured." They saw a very old man almost as white as a Spaniard, he was whiter than his children and had a white beard³.

Information as to the distribution of albinos was obtained from traders and others at the following places in the group: Bagga, a small island near Vella Lavella; Giso Island; Tulagi and Gavutu, two small islands close to Florida island; and at three places along the north coast of the large island of Guadalcanar. Some of the traders who were interrogated had lived for many years in the group, but albinos had only been seen by them at one small island called Savo, where there is a male and a female albino, brother and sister, also, according to another informant, a third albino who is not related to the other two. It has been thought probable that the island of Savo has been occupied by New Georgia natives in comparatively recent years. Its inhabitants differ in their physical characters from those of the surrounding islands, and in their language they differ even more⁴.

A lady missionary said she had seen two albinos on Malaita Island.

There is an albino on Lord Howe Island⁵. Including this island in the group brings up the total number of reported albinos on these islands, with a population of 150,000, to five or six, a proportion of one to 30,000 or 25,000 inhabitants. As no reliable estimation of the population is yet available, this measure of albinism must be accepted with all reserve.

We have found no previous modern notice of albinism on these islands.

New Hebrides. Native population 70,000. The people are mostly of Melanesian race, and dying rapidly of consumption and other diseases.

In 1606 Hernandès de Quiros discovered the New Hebrides. In a group of islands which he called Manicolo, in lat. 14° 30', the natives were generally black, some were white with red beards (probably dyed red), others mulatto⁶. The evidence for the beard being coloured is not stated, nor is it clear whether the suggestion was made by de Quiros.

¹ *The Discovery of the Solomon Islands by Alvaro de Mendaña 1568*, Hakluyt Society, 1901 pp. i, lxii, xl and 181.

² Woodford, C. M., *A Naturalist among the Head Hunters*, London, 1890, p. 186.

³ *Discovery of Solomon Isles*, Hakluyt Society, pp. 133, 276, 255, 116.

⁴ Guppy, *Solomon Islands*, pp. 57—59.

⁵ At least one albino. The Lord Howe island referred to is in lat. 5° 30' S., long. 159° 30' E. It is now inhabited by the descendants of Polynesian castaways, who have the same language and some of the customs of their light coloured ancestors combined with a Melanesian physique. (*Discovery of Solomon Islands*, Hakluyt Society, p. xxi.)

⁶ de Rienzi, G. L. Domeny, *Océanie*, T. III. p. 416, Paris, 1837.

In Eromanga Island the population between 1842 and 1859 was supposed to be about 5000. The families were small, four being considered a large family. One albino was seen¹.

Eckardt in 1877 says there were many albinos, male and female, in the New Hebrides, most of them with diseased red eyes².

Seligmann refers to the photograph of a man from Aoba, who appears to have been one of the spotted-freckled type of albinos³.

From the personal inquiries of C. H. Usher the following items were obtained :

A former resident said that some years ago he saw one female and seven male albinos in these islands ; one had a mottled skin.

Dr W. Gunn, in a letter from Aneityum, New Hebrides, 3rd February, 1908, says that there are no albinos in the two islands with which he is best acquainted.

Dr J. Campbell Nicholson, writing from the New Hebrides, 15th May, 1908, says that he does not think there is a single albino on Tanna, but that there are a good many on several other islands.

New Caledonia. Native population about 26,000. The French penal colony is an island with an area of 4618 sq. miles⁴. The aborigines are a mixture of two types, one resembling Polynesians, the other the Papuans⁵. de Rochas⁶ saw among the New Caledonians five cases of albinism, one being a female. He states that these individuals were not entirely destitute of pigment. Their hair is flax-blond, and finer than that of other natives. The iris was "d'un beau bleu," "le fond de l'œil" black ; the sight, according to de Rochas, was excellent, and the albinos could support perfectly the light of the sun⁷. The skin was of a dull white, sprinkled with stellate spots of brown chestnut colour. It is dry, rough, more or less scaly, dotted with brown daubs due to an exudation from the skin. This species of ichthyosis did not occur with all albinos, one being quite free. The albinos were not less intelligent than other New Caledonians ; they are not sterile, and their offspring are black and perfectly healthy.

Broca, in the discussion which followed the reading of de Rochas' paper, cited Forster as having been the first in the time of Cook⁸ to refer to aborigines in New Caledonia with perfectly blond hair and whiter skin than their compatriots with the countenance covered with red spots (? freckles). He pointed out that the grade of albinism varied, and suggests that it differs from race to race.

There is little doubt that de Rochas' New Caledonian albinos were only other examples of our spotted-freckled albinos of dark skinned races.

In some parts of the Pacific our information is fuller, this is particularly so in the Fijian archipelago.

¹ See Bibl. No. 391, p. 328.

² See Bibl. No. 345.

³ See Bibl. No. 488, p. 805.

⁴ *Whitaker's Almanac*, 1908.

⁵ *Chambers' Encyclopaedia*.

⁶ See Bibl. No. 277, p. 49.

⁷ It is not clear that de Rochas made any ophthalmoscopic examination of the eyes. His paper was read in July, 1860. Certain slight defects may have escaped him as they did Seligmann : see our p. 76.

⁸ An account of the discovery of New Caledonia, Sept. 1774—"a man as white as any European." See Bibl. No. 85, p. 113.

*Fiji*¹. There are 200 islands in Fiji, of which 80 are inhabited. The two principal islands are Viti Levu and Vanua Levu. The aggregate area of the group is 7451 square miles. The population of native Fijians in 1901 was 94,397². At the census of 1891, 105,800 was the number returned. The population had diminished during the previous decade by 8948, as ascertained by a comparison with the census of 1881³. The Fijian population in 1905 was 86,816 (this does not include 2281 Rotumans)—males 45,421, females 41,395⁴.

At the present time there are at least 30 albinos in Fiji—10 males and 14 females; in six cases the sex is not stated. This gives a proportion of one albino to every 2900 of the population. From information obtained in Fiji when the albino pedigrees were being constructed, other 35 albinos now dead can be added to the number, 23 of these were males, 11 females, and in one the sex is not stated. Of the 65 past and present albinos the sex is known in 58, 33 males and 25 females; there is therefore a preponderance of males.

Table showing the locality of the 30 living albinos and the 35 dead albinos. The number of albinos at each place and the population⁵ of the corresponding island is marked.

Locality	Living albinos					Dead albinos	
VITI LEVU 68,513							
Sigatoka	1	...	...	...	...	0	Fig. 436
Korolevu	1	...	...	...	...	1	Fig. 429
Noco	2	...	...	...	...	6	Fig. 329
Suva	1	...	...	...	...	0	Fig. 388
Drekena	1	...	...	...	...	1	Fig. 333
Tavua	1	...	...	...	...	2	Fig. 386
Togovere (Ra Province) ...	1	...	...	...	...	1	Fig. 334
Waidina	1	...	...	...	...	1	
Vunisinu	1	...	...	...	...	2	Fig. 390
Vatukacevaceva	1	...	...	...	...	0	
Dawasamu (Bau Territory)	1	...	...	...	...	0	
Nausori	0	...	...	...	...	1	Fig. 332
Vutia	0	...	...	...	...	1	Fig. 330
Vitogo	2	...	...	...	...	1	Fig. 485
Naveiyago ⁶	0	...	...	...	...	2	
VANUA LEVU 18,748							
Nubu	1	...	...	...	...	0	
Navave	1	...	...	...	...	0	
Cakandrove	1	...	...	...	...	0	
Wailea	1	...	...	...	...	0	
Hills behind Wailevu ...	1	...	...	...	...	0	

¹ Mr Kenneth J. Allardyce, Commissioner of Native Lands, kindly obtained information as to where the albinos dwelt. He also acted as interpreter and obtained the pedigrees of most of the cases. Mr Allardyce's thorough knowledge of native customs and language, together with the care that has been taken in constructing the pedigrees, should make these as free as is possible from error. Mr Allardyce is entirely responsible for Cases 41—46, see our p. 62.

² *Whitaker's Almanac*, 1908.

³ *Report of the Commission appointed to inquire into the Decrease of the Native Population*, 1896, p. 6.

⁴ *Handbook to Fiji*, 1906.

⁵ Population taken from the 1891 census.

⁶ There is said to have been an albino brother and sister here, who died 30 years ago.

Locality	Living albinos				Dead albinos	
	<i>Brought forward</i>	19	...	...	...	19
KORO 1340	...	2	...	...	...	0 Fig. 331
GAU 1755	...	3	...	...	...	1 Fig. 444
BATIKI 318	...	1	...	...	...	0 Fig. 385
KADAVU 6895	...	4	...	...	...	11 { Figs. 326—328. See Map, p. 49 of Appendix
BAU	...	1	...	...	...	0 Fig. 385
OVALAU	...	0	...	...	...	3 Fig. 389
YASAWA ¹	...	0	...	...	...	1
		30				35

It seems unlikely that all the albinos at present alive in Fiji have been brought to notice, for there are certain localities where our information is insufficient to warrant a statement as to whether or not there are albinos there. Still it is improbable that there are many not yet reported.

Localities where information is insufficient to allow us to state whether albinos are or are not present. Bega, a small island off the south coast of Viti Levu. A native from there said there were no albinos on the island. He maintained that one reported to be there must have been a visitor. Kia off the north coast of Vanua Levu.

Localities where there are no albinos. (In the list (*u*) means uninhabited and (*nn*) that there are no natives on the island.) Malake and Nananu islands off the Ra coast; Naigani north-west of Ovalau; Moturiki south-west of Ovalau; Viwa close to Bau; Nukalu (*u*) and Makuluva; Vatulele; Yadua west of Vanua Levu; small islands off the coast of Vanua Levu; Taviuni; Makogai (*nn*); Wakaya (*nn*); Vatu (*u*); Nairai; Weilangilala (*nn*); Qumea; Laucala; Naitaba, Malima, Kanacea, Munia, Mago, Katavaga, Vatuvara and Aiwa are Windward islands with no natives on them; Olorua (*u*); Vuagava (*u*); Yagasa islands (*u*); Cikobia, Vanuabalavu, Yacata, Tuvuca, Cicia, Nayau, Lakeba, Vanuavatu, Oneata, Moco, Namuka, Kabara, Vulaga, Ogea, Vatoa and Ono are Windward islands with no albinos on them; Moala; Matuku and Totoya. Malolo group off the N.W. coast of Viti Levu and Yasawa group, both visited recently by Mr Allardyce.

With reference to the distribution of albinos in Fiji it is noticeable that not one albino can be heard of in the Windward, Eastern or Lau group. The population of this group when we include the islands of Taviuni, Totoya, Moala and Matuku is 7556 at least². In the Eastern districts of Fiji there has been a large intermixture with the Tongans, this dates back for many generations. In the Western districts the intermixture is hardly traceable³. The Tonga or Friendly islands are between 200 and 300 miles to the south-east of Fiji. The trade winds will account for the Tongan

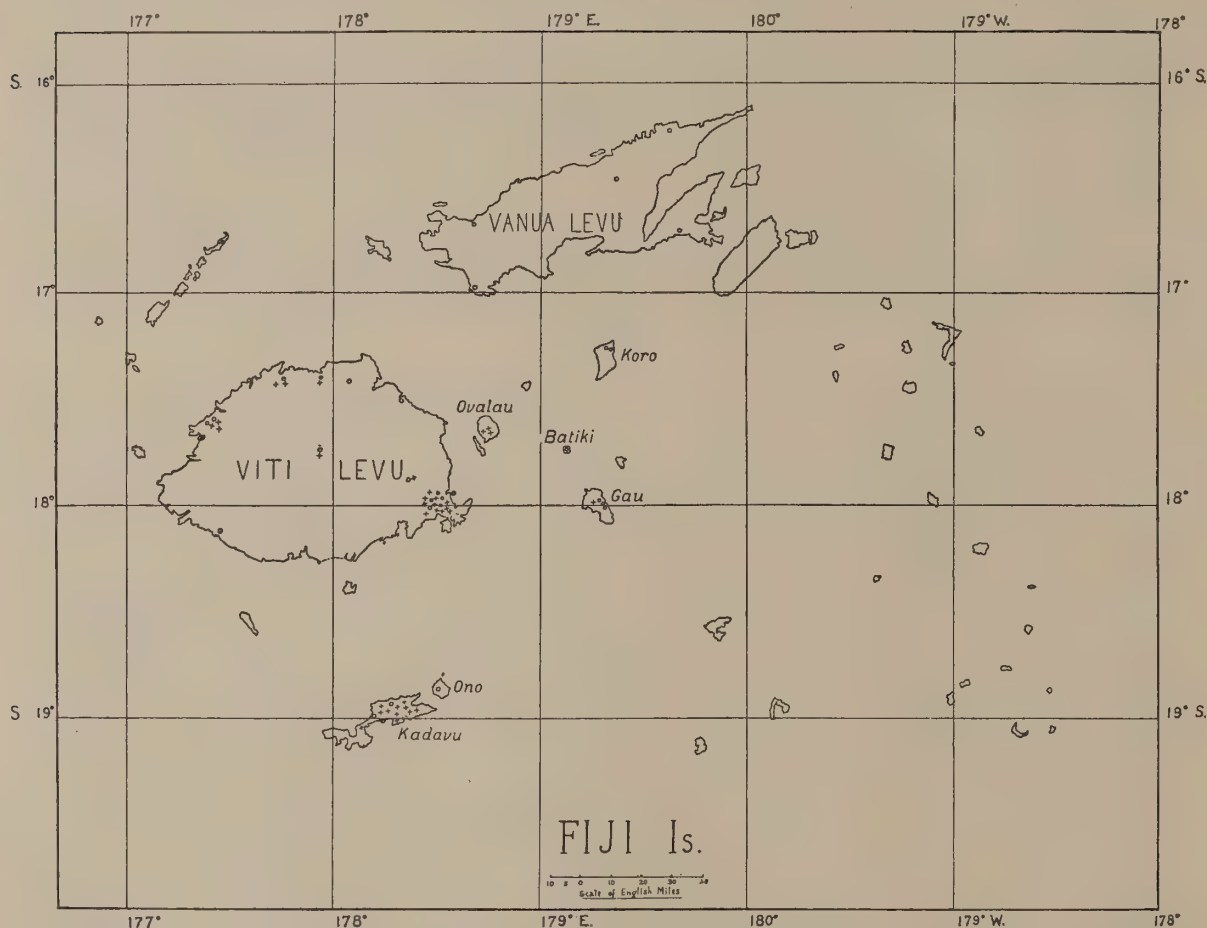
¹ This group of islands contained no living albinos when visited by Mr Allardyce in 1908, but a male albino formerly lived at the village of Dalomo. He died as a youth some 30 years ago. He is alleged to have been the illegitimate son of a chief from Bua, on the west coast of Vanua Levu.

² 1891 *Census, Report of Commission on Decrease of Native Population*, 1896, p. 3.

³ Pritchard, *Journal Anthropolog. Soc.*, London, 1865, Vol. III. pp. cxlvi—clx.

immigration which at first was purely accidental¹. The importation of Tongan blood into Fiji is greater than the importation of Fijian blood into Tonga².

The majority of the albinos—44 of the 65, *i.e.* 17 of the 30 living albinos and 27 of the 35 dead albinos—are from the south-east corner of Viti Levu, *viz.* from the Rewa and Tailevu provinces and from the islands of Gau, Batiki, Kadavu, Koro and Ovalau, all of which have been connected with it (see map). Rewa Province includes Rewa village, Rewa district, Naco and Vutia villages. Tailevu Province includes Bau Island, Bau district and Verata district, now less important than formerly.



Map of the Fiji islands to show the distribution of albinism.

+ represents a dead albino. o represents a living albino.

The map is drawn to such a small scale that it has only been possible to indicate approximately the places of the albinos. On the small islands the marks are placed anywhere within the outline of the island. The reader will find a lens of service.

Batiki, Gau and Koro islands were all subject to Bau, and the island of Kadavu was acquired by Tambiavalu, under whose reign Rewa became an important town.

¹ Reid, Mayne, *Odd People, or Singular Races of Man*, 1860.

² Pritchard, W. T., *Polynesian Reminiscences, or Life in the South Pacific Islands*, p. 384.

His eldest son was the child of a Kadavu woman¹. At the beginning of the nineteenth century Verata², on Viti Levu about eight miles from Bau, was the principal town in Fiji, Rewa and the islands of Ovalau, Koro, Batiki and Gau were subject to it³. (Bau is a small island close to the mainland of Viti Levu. It is not many miles from the village of Rewa.) That there was a close connection between these islands and the south-east corner of Viti Levu is made all the more certain by the circumstance that intermarriage occurred between the people of these islands and the people in the Bau district. Some of the albino families living at present in these islands have ancestors who came from Bau and vice versa.

In Batiki island, Siteri (Case 13, Fig. 385, VII. 1) has an ancestor on her mother's side, called Buinivuaka, who came from Bau. One at least of Buinivuaka's wives also came from Bau. A chief from Bau (Fig. 385, V. 16) married a woman (V. 7) from Naigani village on Batiki island and had an albino son, the present Bau albino (died, Christmas, 1908), and three normal children. Mereone Sinudamu (Case 6, Fig. 233, V. 5) from Drekena village in Rewa district, has a great-grandmother (II. 2) on her father's side, who came from Kadavu island, but there was no known connection with the Keleni albino (Case 43, Fig. 328, III. 3). The mataqali of an albino family in Kadavu (Case 42, Fig. 327) is said to have the same god as a mataqali in the village of Naigani on Batiki island. It is from this village in Batiki island that the mother (Case 13, Fig. 385, V. 7) of an albino, Ratu Qatia, living in Bau, came. The god of the Kadavu mataqali is an albino.

A mataqali means a division of a tribe. This may consist of a few or several hundred persons. Any two members of a mataqali must be related to some extent. The Noco family (Cases 7, 8 and 9, Fig. 329, V. 8—10) were connected with both Kadavu and Batiki. I. 1 married a Kadavu woman, II. 3 also married a Kadavu woman. II. 7, the wife of II. 5, came from Batiki island, but not from the village of Yavu where Siteri the present Batiki albino lives, therefore probably from the village of Naigani where the Bau albino's mother (Case 13, V. 7) came from. The population of Batiki is only 318 and it seems there are only two villages on the island.

On Koro island there are people at the present time closely related with the Bau people. At the village of Sinuvaca on Koro island are two female albino children (Fig. 331), but whether they have relationship with the Bau people or not there was no opportunity for determining.

Although the pedigree of an albino family on the island of Ovalau (Case 45, Fig. 389) does not show that there is any relationship between members of the family and the people in the south-east corner of Viti Levu, the exceptional character of this pedigree—the marriage of a male albino with a female albino, with children—calls for remark. Our principal informant, a chief called Veleti, from the village of Vuma, which is a few miles from Levuka, the chief town of Ovalau, an old man noted for his retentive

¹ See Bibl. No. 216, Vol. III. pp. 184, 186, 199 and 131.

² No town of this name any longer exists, but there is a district called so.

³ See Bibl. No. 216, Vol. II. p. 35.

memory, which is still quite clear, said there are no albinos now on the island, but he formerly knew one, now dead, called Bulainamotu (Fig. 389, III. 5). Mr C. W. Thomas, for many years a planter in Fiji, who has an excellent knowledge of the Fijians and their language, kindly acted as interpreter, and spent much time and care in obtaining the history of this case. When the part of the pedigree was reached in which the albino's (Bulainamotu) paternal grandparents occur, Veleti, our informant, stated that not only was I. 3 an albino, but also his wife I. 4. When cross-questioned and asked if he did not mean that I. 5 was an albino and not I. 4, he still maintained that what he had said was correct and could not be made to alter his original statement. When he was told that we had never heard of such a thing as two albinos intermarrying¹, he replied "I cannot help that, I have often heard them—the albino man and wife—spoken about, and I believe it." It then transpired that Veleti himself was related to the albinos, he was called uncle by Bulainamotu, and was eight years senior to him. It is not quite certain what the relationship is, but probably Veleti's father was a brother of the albino I. 3.

There seems no reason to doubt that Veleti believed all that he told us, but whether the statements received by him concerning the two intermarried albinos were true, of course cannot be vouched for. Perhaps the weakest point in the history is that Veleti never saw the albinos, I. 3 and 4, especially if he really was a nephew of I. 3, which is not certain; but even although he had been a nephew of I. 3 it is by no means impossible that he might not have seen the intermarried albinos. It must be remembered that all pedigrees in Fiji are obtained from the natives without any reference to written records, and it is just as likely that this pedigree should be true as any of the others. The only difference is that in this case there was only one informant of importance.

It was from these islands, Ovalau, Koro, Kadavu, Gau, Batiki and the south-east corner of Viti Levu with which they were connected, that 44 of the total number of Fijian albinos—65—came. It may properly be objected that the proportion of albinos in the south-east corner of Viti Levu and the islands connected with it is possibly represented as too large, in consequence of absence of information concerning the pedigrees of five albinos on Vanua Levu and two on Viti Levu living beyond the south-east corner, for it is reasonable to suppose that in these pedigrees some other albinos would be found. To be set against these, however, are the albinos in Koro island, and one albino at Kadavu, whose pedigrees have not been obtained.

The few cases of Fijian albinos previously reported, some many years ago, have not been included in this enumeration because it is impossible to identify them. No names have been given and it is therefore possible that some of them are included in our 65 cases. It is necessary in estimating the numbers of albinos to have their names, otherwise there may appear to be more than actually exist. This was well exemplified in the case of the Bau albino (Ratu Qatia). A male albino was heard of, not seen, at Bau, Levuka and Batiki, also when visiting Koro island a male albino

¹ Since then two other cases of the intermarriage of albinos have come to our notice: see pp. 20 and 46; Figs. 307, 605.

happened to be there, although not seen. It turned out that in each of these four places it had been the same albino. If his name had not been known the presence of four albinos might have been recorded instead of one.

The following previously reported cases of Fijian albinos are not included in our list :

On Gau island three albinos were seen some twenty-five years ago¹; one of them was a boy about eighteen years of age. It is possible that he may be Etonia Bian (Case 12). "His flesh was pale pink, blotched on the shoulders, and his hair a very pale yellow, and eyes very weak." The second albino was a child. "The third albino was a woman of quite a natural white, with very fair hair and pale blue eyes." This woman cannot be any of the albinos seen by us, nor does she come into the pedigree of Cases 10, 11 and 12. The village on Gau island where she lived is not mentioned.

The same writer was told of albino twins, a boy and girl, who grew up. It is not stated whether they lived on Gau island, so they may be the same twins, an albino boy and girl, both of whom reached maturity, mentioned by Williams² at the village of Na Vavi, which is at Cocoanut Point on Vanua Levu, where there is an albino at the present time. Williams saw five albinos during his residence in Fiji; "In three of these, who were adults, the skin had an unnatural appearance; it was whiter than that of an Englishman who had been exposed to the sun, and smooth and horny to the touch. Through the heat of the sun it was deeply cracked and spotted with large brown freckle-like marks, left by old sun-sores. All these persons suffered much from exposure to the sun, and never, as far as I could learn, became accustomed to the heat. The skin had a slight tinge of red, and the hair, together with that of the head, was of a flaxen colour. In two cases the iris was blue, and in the third there was a sandy tinge. The eyes were kept half closed, as though unable to bear much light. One man of this class I knew well. He lived for four years near me, and was industrious and good-tempered, and eventually became a Christian. Natives are sometimes seen with white hands or feet, the effect of disease; but this blanched appearance never spreads over the body, neither are the parts affected painfully sensitive to the sun's heat. The last albino that I saw, was a child of two or three weeks old, born of Christian parents who were young and healthy. It was a remarkable object, the skin being much whiter than the generality of English infants, and very clear."

In 1874 an albino boy was seen at Nakello, a village on the Rewa river, by the biologist of the *Challenger* expedition³. "He was perfectly white, his skin having a peculiar look as if covered with white powder in places. His eyes, which he hid either from the light or because of shyness, appeared as if the iris were of a pale grey colour. His parents said he could see perfectly, but I could not examine him closely as he roared at the prospect. Albinos seemed unusually common among Melanesians."

On Kadavu, Buchner mentions (1878) that he saw an albino boy with fair hair,

¹ C. F. Gordon Cumming: see our Bibl. No. 377, 1882, p. 174.

² See our Bibl. No. 270, 1858, p. 106.

³ See our Bibl. No. 399, p. 506.

bluish eyes with inflamed lids, and rose-coloured skin¹, whom the other lads called *Papalang lailai* (little European). Buchner says he might have passed for a German peasant boy.

On the voyage of the United States Exploring Expedition (1838-42) during the visit to Vatuara, a town not far from Sandelwood Bay in Vanua Levu, an albino said to resemble "the lower class of Irish" was met with. His skin was dirty white, and fairer than that of a European would be if exposed to the sun; he was marked with many brown spots about the size of sixpence or less; his hair was the same colour as that of those natives who use lime water in cleaning it; his eyes were almost constantly closed as if the light affected them; the iris was blue, no tinge of red. The natives called him *Arua*, and he was about 30 years old. On a subsequent visit he had dyed his hair coal-black, which gave him an odd appearance. The white men said that albinos were not infrequent.

The high relative frequency of albinism in Fiji (see p. 84) suggested some inquiry as to the number of consanguineous marriages. In *Fiji* marriages and illicit unions between blood-relations are very common. Formerly first cousins whose father and mother were brother and sister—"orthogamous cousins"—not only might marry, but the female cousin was compelled to marry the male if he chose to claim her². First cousins whose fathers were brothers or whose mothers were sisters were strictly forbidden to marry. Though the permitted consanguineous marriages are now less frequent than formerly, illicit unions between cousins of the permitted degree are quite common and prohibited consanguineous marriages are fairly common³. In 12 villages 42 % of 448 marriages were between blood-relations—29·7 % were between orthogamous cousins and 12·3 % between relations other than orthogamous cousins⁴.

In *Samoa* and *Rotuma* cousin marriage is forbidden. The same rule is recognised in the *Gilbert Islands*, with the exception of Apemama and Makin, and is there only violated by the high chiefs. In *Malanta* (*Solomon Group*) orthogamous marriage is unknown.

In *Tonga* the union of grandchildren (and occasionally even of the children of a brother and sister) is regarded as proper for the superior chiefs, but not for the common people⁵. Other races in the Pacific with the exception of the inhabitants of Tanna in the New Hebrides and possibly some other islands are comparatively free from the influence of orthogamous courtship which in the Fijians undoubtedly promotes in a marked way consanguineous marriages⁶.

Rotuma. An island 300 miles N.N.W. of Fiji. Population said to be 2300. It is difficult to ascertain whether it falls into the Melanesian or Micronesian groups. According to Dr John Halley (Letter of 13 Nov. 1908) the population is very mixed in type. Dr Halley kindly made inquiry as to albinism on this island. He received information as to two albinos who were remembered but neither were now alive, and he visited the families of both. In the one family there was no evidence of albinism

¹ See our Bibl. No. 352.

² *Report of Commission on Decrease of native Population in Fiji*, 1896, § 34.

³ *Ibid.* § 31.

⁴ *Ibid.* § 48.

⁵ *Ibid.* § 41.

⁶ *Ibid.* § 44.

or any congenital defect in any of the living members. Of the other family as much of the family tree as is known is given in our Fig. 567.

Micronesians. Our only information is with regard to the Ellice Islands, Gilbert Islands and Caroline Islands.

Ellice Islands. The U.S. Exploring Expedition of 1838-42 came across two albinos on Depeyster's Island. See the full account given under our Fig. 342. In this case the eyes were affected, and although red pupils are not mentioned, there is little doubt that they were practically complete albinos.

Depeyster Island is Nukufetau, and is an atoll now inhabited by about 350 natives all living in one village—the stock is now chiefly Samoan. Staff-Surgeon Lobb was told that this place was depopulated in the early seventies by slavers and has never recovered. First cousin marriages are discountenanced but, he thinks not forbidden. The island has probably from early times been on the borderland of Melanesian and Polynesian races.

In 1875 Wood¹ reported a few albinos on Nukufetau, they had flaxen hair, a much freckled skin and more the colour of a white pig than of a European. In 1908 Dr Alex. Robertson saw at Nukufetau a male albino, aged 12. He was almost white, had blue eyes with yellow colour round margin of iris. With the exception of a pustular eruption on face (acne) he was healthy; mental condition was normal. His parents were of the usual Kanaka's colour and healthy. According to the native magistrate all the other members of the family were normal and did not present any deformity. If we assume this lad to be "Lamosi" of Staff-Surgeon Lobb's case, the "family" referred to is only the immediate relatives.

Our fullest account of albinism in Nukufetau is due to Staff-Surgeon Lobb, who examined two albinos (Cases 24 and 25) there in 1907, and provided the material embraced in our Fig. 354. In these two cases there were nystagmus, photophobia and the red reflex; thus showing that there is not a qualitative, but probably only a quantitative difference between albinism of the dark and light skinned races. A few facts additional to those given in Fig. 354 may be added here as marking some of the difficulties of forming albinotic pedigrees in these regions.

The two albinos "Podini" and "Lamosi" are related, their maternal grandmothers were sisters. The families in which Podini and Lamosi are members do not consider themselves in any way related to each other. Both state constantly that there has always been an albino in their family, but Staff-Surgeon Lobb could not ascertain whether this occurred at irregular intervals or not; he only discovered the connection of the two families by referring to a very old man. They can only be accurate for two generations back, though the story of a family which "always" contained an albino extends back as long as they can remember anything. The parents of both albinos were normal natives. As regards the grandparents of the albinos, it is only known that their maternal grandfathers were normal natives. It is not known whether any of the other grandparents were albinos or not. In tracing descent a good deal of difficulty is experienced, as after "father" the only term used

¹ See Bibl. No. 334.

is "forefather"; grandfather, great-grandfather are absolutely unknown. Possessives are not understood and "father's father" or "his father" simply means "a" or "the" father.

The mother of Lamosi was present, but could not say with certainty as to whether any of her father's or mother's brothers and sisters were albinos. The mother of Podini belonged to a family of unknown size and the existence of albinos in it could not be ascertained. In the pedigree there is no evidence for or against any of the marriages being consanguineous, nor could a former albino be placed in any given generation or family. The pedigree was constructed under difficulties as very few natives spoke English well enough to be of use in probing any point deeply and the best interpreters were not available at the time.

The story given to Staff-Surgeon Lobb by the natives that there has always been an albino in the family seems likely to be true because albinos, as we have seen, were reported at Nukufetau more than thirty years ago, and again more than sixty-five years ago.

Gilbert Islands. While the total population of the 9 Ellice Islands is given as 2500, the Gilbert group of 16 islands and several islets is stated to be about 37,000¹. Our knowledge of albinism in the Gilbert Islands is due to Mr George M. Murdoch, for 28 years a resident in the group. He says "there is only one male albino in the group of islands"; presumably there is no female albino. The account of this albino, Hiram Teeko, as transmitted to us, is given in Fig. 576. His photograph, sent through Dr Robertson, is on Plate GG, and a specimen of his hair (reproduced on Plate κ as S₆) has reached us since the account of Fig. 576 was printed. Notes on the marriage customs of the Gilbert Islands have been most kindly supplied by Mr Murdoch, and we hope they may be shortly published in an anthropological journal.

Caroline Islands. We have only found one reference to albinism on these islands namely in a medical report by Dr Boon on the *Karolinen und Marshall-Inseln*². He notes a peculiarly interesting case of three albinos at Ifaluk, a youth and two girls, the offspring of apparently syphilitic parents; they all three themselves showed signs of syphilis, especially the youth, aged about 18, whose face was terribly eaten away. The eyes of all three albinos exhibited a high degree of nystagmus. Two younger siblings were apparently healthy and of the usual type of the inhabitants of Ifaluk. The association of parental syphilis and filial albinism in this case is most probably quite accidental, but as it has occurred in one or two other cases which have come under our notice, it is just conceivable that parental syphilis may be occasionally favourable to the appearance of albinism, and records might well be made, when possible, of any syphilitic taint in the parentage of albinos. Heredity is from our standpoint the chief factor of albinism, but some of our very extensive pedigrees with albinism appearing in perhaps a single case suggest that in rare instances albinism—possibly in a non-hereditary form—may appear in response to pathological parental conditions.

¹ *Whitaker's Almanac*, 1908, and *Chambers' Encyclopaedia*.

² *Medizinal-Berichte über die deutschen Schutzgebiete*, 1906-7. A. *West Karolinen*, S. 244.

Polynesians. Passing to the more purely Polynesian districts we note :

Tonga or Friendly Isles. These are 250 miles E.S.E. of Fiji. The native population was given in 1905 as 21,103¹. The earliest record of the possible existence of an albino in these islands appears to be the fact recorded by W. Cornelis Schouten², who, in his voyage of 1615-17, when relating the discovery of Nina-tobutabu and Futuma, wrote: "We were surrounded by quite 1000 people afloat, of whom one we noticed was wholly white." Nina-tobutabu is Keppel Island, which is situated between Tonga and Samoa, and Futuma = Fotuna between Fiji and Samoa, but slightly to the north of a line between these two groups. Cook³ writes of his visit to the Friendly Isles in July, 1777: "We saw a man and a boy at Hapae and a child at Annamooka perfectly white. Such have been found among all black nations, but I apprehend that their colour is rather a disease than a natural phenomenon." Hapai is a group of islands in the Tonga group, Annamuka or Namuka is one of the Tonga Islands. Cook's spelling differs from the more modern forms.

Labillardière in his account of the voyage of *La Perouse* in 1791-2⁴ refers to a young female albino seen on the island of Tongatabou.

Martin, in *An Account of the Natives of the Tonga Islands* 1817 (a work compiled from the communications of William Mariner, who had been resident there for four years) does not make mention of albinos in his chapter on diseases, or elsewhere in his writings; neither is there a word given for "albino" in the large vocabulary of native words. White is given as *Hi'na-hi'na*, tea.

Niuē Island (Inui or Savage Island) is situated 240 miles nearly east of Vavau in the Tonga group. S. Percy Smith⁵ says there are a few albinos on this island. They are called *Mahele*, and are as unprepossessing as the Korako among the Maoris.

Cook Islands, near 20° S. Lat. and 158° W. Long. Native population in 1902 amounted to 6234. They are mainly of brown Polynesian stock.

The Rev. William N. Lawrence⁶, who has repeatedly seen every native in this group of islands, cannot remember any albinos, except one doubtful case, that of a little girl; she would be now about 14 years old. There are fair-haired people among the natives, fair-hairedness seeming to run in families. Such fair-haired people are called *Tamariki na Tangaroa*⁷, that is children of Tangaroa. There were two principal gods, Rongo and Tangaroa, and the latter was supposed to be fair-skinned and fair-haired; hence the name given to fair people. Mr Lawrence says they are not very fair, and there does not seem to be any peculiarity about their eyes. Cousin marriages are very uncommon among the Cook islanders, and the people are rather ashamed of such marriages, but Mr Lawrence has known cases.

Samoa. The four largest islands are Savaii, Upolu, Tutuila and Manua. The town of Apia is on Upolu. The native population is 35,000. The Samoans are said

¹ *Whitaker's Almanac*, 1908, and *Chambers' Encyclopaedia*.

² See Bibl. No. 448, cited by Basil Thomson, p. 400.

³ See Bibl. No. 86.

⁴ See Bibl. No. 120, T. II. p. 141.

⁵ See Bibl. No. 491, p. 166.

⁶ Letter of April 16, 1908, from Papua.

⁷ Tangaloa (= Tangaroa?) is one of the principal gods of the Tonga Islands. See pp. 34 and 65, Vol. I., *The Polynesian Race* (Fornander).

to be the lightest in colour of all the Pacific Islanders. According to Stair (1897) albinos were occasionally found, whose pink eyes and white skins formed a strange contrast to the rich brown colour of their associates¹. Kraemer, in 1902, writes that albinos are by no means uncommon in Samoa². Miss Beatrice Grimshaw³, in 1907, gives a portrait of a Samoan albino, whom she saw at a guesthouse in Falefa, and writes: "In the centre of the group was the most extraordinary figure I had ever seen—a white man, his skin burnt to an unwholesome pink by exposure; his hair pure gold, extremely fine and silky, and so thick as to make a huge halo round his face when shaken out. His eyes were weak and half shut, and we were not surprised to hear that he was not really of white descent, being simply a Samoan albino, born of brown parents. This man, being the son of a chief, took the principal figure in the dance that was now got up for our amusement."

In 1907 C. H. Usher obtained information with regard to albinos in Samoa. A German, who had traded for seven or eight years in different parts of Samoa, at present in Savaii, knows an albino in Savaii who has a normally coloured sister and parents. This gentleman has occasionally seen an albino boy and girl in Upolu. He did not know whether they were related. Another gentleman, six years in Samoa, has seen two albinos in Apia, a brother and a sister (see our Fig. 339). As Apia is a town on Upolu these albinos may be the same as those just mentioned. Mr Michael J. Nicoll in a letter to E. Nettleship of Sept. 23, 1908, states that he had seen (in 1907) at a village near Apia "a perfect albino boy of about six years of age. Skin very white, hair white and eyes pale pinkish. A most extraordinary looking creature. I was not able to examine him closely as he was very frightened, but the chief of the village told me that he was a pure-bred Samoan."

A missionary, resident in Samoa for more than ten years, knows a family of albinos in Falealili in Upolu, across the island from Apia. She has also seen albinos in Apia. A former resident for one year in Samoa said he had seen about six albinos. Clearly albinism must be fairly frequent in Samoa, perhaps one albino to 5000 normal inhabitants.

Tetea is the Samoan name for albino. There is a saying that "In vain the albino has been concealed, he does not remain hidden" (*Vergebens hat man den Albino versteckt, er blieb nicht verborgen*). A story connected with this tells that the parents of a female albino child were ashamed and hid the girl in a hole where she was left to her fate. The mother subsequently bore a son, who one day, when fishing, found his sister still alive⁴.

It is said that albinos in Samoa are valued for their hair, which is cut when it is long to make head-dresses for the chiefs. Another informant had also heard this stated, but had never known of any case. Only chiefs are allowed to use white. Mosquito switches are used by the natives, they are made mostly from some fibre, but the chiefs use white horse-hair. Chiefs do wear a hair head-dress, according to another informant, made from the hair of girls which is grown long on purpose, and is of a light colour, the result of bleaching.

¹ See Bibl. No. 471.

² See Bibl. No. 514.

³ See Bibl. No. 558.

⁴ See Bibl. No. 550.

Society Islands. The chief island is Tahiti or Otaheite. It embraces 450 sq. miles out of a total of 640 for the entire archipelago. The population of the archipelago in 1900 was 16,300. In 1769, at the time of Captain Cook's first visit, the population is stated to have been a quarter of a million¹.

Cook² first reported the existence of albinism in Otaheite [April 24, 1769]: "Just as they [Mr Banks and Dr Solander] had formed this resolution, one of the natives offered them refreshment, which they accepted. They found this man to be of a kind that has been described by various authors as mixed with many nations, but distinct from them all. His skin was of a dead white, without the least appearance of what is called complexion, though some parts of his body were less white than others. His hair, eye-brows, and beard were as white as his skin; his eyes appeared as if they were bloodshot, and he seemed to be very shortsighted." And again later³:

"During our stay in this island we saw about five or six persons like one that was met by Mr Banks and Dr Solander on the 24th of April in their walk to the eastward, whose skins were of a dead white, like the nose of a white horse; with white hair, beard, brows and eye-lashes; red, tender eyes; a short sight and scurfy skins, covered with a kind of white down; but we found that no two of these belonged to the same family, and therefore concluded, that they were not a species, but unhappy individuals rendered anomalous by disease."

That albinos must have been fairly frequent in Otaheite in those days is clear from this account. That they still are to be found is shown by the letter of Mr Michael J. Nicoll [Sept. 23, 1908] already quoted, who writes:

"In Papeeta, Tahiti, I saw a woman, a servant of the sister of Queen Pomare, who, although a pure-bred Tahitian, was quite fair with very pale eyes—light greyish—and an enormous length of pale golden hair, very thick. This woman was aged about 40 I should say. This, I imagine, was a case of partial albinism."

Pitcairn Island. In 1790 Pitcairn Island, then uninhabited, was taken possession of by nine of the mutineers of H.M.S. "Bounty," with six Tahitian men and a dozen women, the ringleader being called Christian. Four years later all the Englishmen, except Alex. Smith (John Adams) were murdered by the Tahitian men. Thereupon the women, in revenge, murdered all the Tahitian men. At the end of ten years Adams was left alone with eight or nine women and several children; and from them the present inhabitants are descended. One American has been introduced since they arrived from the "Bounty." In 1831 their number had increased to 87. At this time they were taken to Tahiti, but most of them returned in about nine months. In 1856 nearly 200 of the islanders were transferred to Norfolk Island⁴, but a number of them afterwards returned. The population is now said to be 144.

It is said, and although Staff-Surgeon Lobb cannot vouch for the exact accuracy of the statement, he thinks it highly probable, that the remotest degree of relationship

¹ *Chambers' Encyclopaedia.*

² See Bibl. No. 76, Vol. XII. p. 439.

³ See Bibl. No. 76, Vol. XIII. p. 6. Also Hawkesworth's Edition, Vol. II. pp. 99 and 188.

⁴ Norfolk Island. A small island 400 miles N.N.W. of New Zealand. In 1900 the population was 827 including 150 Melanesians. There are no albinos amongst them.

existing between any two persons of the community is that of second cousins. There are only some five or six names in the island.

When visiting this island in the summer of 1907, Staff-Surgeon Lobb saw a male, aged about 18, so devoid of pigment as to be practically an albino. He had a vacant expression and listless manner. An opportunity for fully examining him did not present itself. The case (our Fig. 421) is of special interest, for it appears to be another illustration of albinism arising a generation or two after a mixture of races. The following information with regard to this family is due to Mr W. H. Petch, formerly Government Secretary of Pitcairn Island. The whole story is of such interest, historically and sociologically, that a fuller report than is attached to Fig. 421 may well be put on record.

The albino IV. 5 had an albino brother or sister, IV. 4, who died as the result of an accident, and an illegitimate half-brother, IV. 6, an epileptic, a child of his mother by a first cousin, III. 7, who was hung for murder. This half-brother was the result of intercourse after the murder had been committed. Neither of the albinos has shown much intelligence. Their parents, III. 4 and 5, were not albinos, but they were cousins. The father, III. 4, was the offspring of II. 1 and I. 1; the mother, III. 5, was the daughter of II. 2, the first cousin of II. 1 and II. 4. Further I. 1 and I. 2 are sister and brother (*not marked as such on pedigree*). The former is the aunt of II. 2. II. 1 was illegitimate. II. 4, now dead, married II. 2. Her name was the same as that of II. 1. They claim to be a separate family, but as II. 1 is aged 60 and II. 4 would have been about the same age had she lived, they were only a generation or two removed from the original white inhabitant of the island, whose name they bear. II. 3, sister of II. 2 and cousin of II. 1, was the mother of III. 7. III. 3 married his cousin, III. 6, and his family was normal. II. 2 and his family are all "more or less touched in the upper story"; "he was once off his cocoanut for almost a year, and is yet often in that condition for short periods; his family, also, have all been 'off' and are liable to become so at times." III. 1 and 2 married wives with their own name and have perfectly sound children. Although we have no details of the albinos, IV. 4 and 5, there can be little doubt that they were albinos, because: (a) Dr Lobb saw one and recognised it as an albino; (b) Mr Petch, who has provided much information, writes as one having no doubt that both IV. 4 and 5 are albinos¹. A special study of pigment heredity in Pitcairn Island would undoubtedly provide much of interest.

Easter Island. This, the easternmost island in the Pacific group, belongs to Chili

¹ Some emphasis is needful on this point, because Staff-Surgeon Lobb and our informant singled out IV. 4 and 5 as differentiated from the other Pitcairn Island children. On the other hand Mr Nicoll, being asked as to the complexion of the Pitcairn Islanders, kindly replied in a letter of 23 Sept. 1908: "The oldest people on that Island are hardly to be distinguished from old English people at 84 years of age. The next generation, *i.e.* the children of the old people, resemble Tahitians in every respect, but their children are quite fair, *not albinos*, but with fair golden hair, blue eyes and fair complexions." Now it must be noted that these attributes are *not* universally characteristic of English children, but are typical of Pacific native albinos. If Mr Nicoll's statement be generally correct we should have a remarkable alternation of generations. It is more likely to be a segregation effect observed in one of the families which came specially under his cognisance.

(27° 8' S. Lat., 109° 24' W. Long.). The population between 1860 and 1892 dwindled from 3000 to 150, a result attributed to emigration and polyandry.

In Behrens' narrative of Roggeveen's visit to Easter Island in 1722 the natives are described as having a brownish complexion, about the hue of a Spaniard; some were darker and others quite white, a few had a reddish tint as if severely tanned by the sun. "An entirely white man, who was wearing white chocks of wood in his ears as large as one's fist, came on board together with many others of his people¹." A native of Pitcairn Island, aged 56, a diver, said to have been in all parts of the Pacific, stated in 1907 that he had seen an albino on Easter Island many years ago, but he could not remember the sex.

Hawaiian Group. This is the northern boundary of the Polynesian race. The native population in 1900 was 29,834. The natives have largely decreased. They were said to number 200,000 in Captain Cook's time.

Buchner² in 1878 refers to an albino he saw on Hawaii—of "wholly the same Germanic type," viz. rosy skin, blond hair and blue eyes—as the boy he had seen on Kadavu, Fiji (see our p. 89). Dr Emerson, who has spent most of his life in the islands, remembers only one family of albinos. There were at least two albinos in the family. He saw them in 1878, and perhaps since then. They lived on Oahu, at Kamananui, near Waialua.

Dr J. J. Grace, of Hilo, on Hawaii itself, used to know of one or two cases of albinism amongst the natives of that island. At present he knows of two albinos in Hawaii, both within a radius of 30 miles of Hilo. One, however, Dr Grace believes is a Porto Rican negro, the other is a native Hawaiian, the II. 1 of our Fig. 494. This man has a living albino brother and a dead albino sister, and an albino female cousin who moved to another island and has been lost sight of. There is, therefore, no reason to suppose albinism rare in Hawaii, for three living albinos would give 1 to 10,000 normals, a ratio equal to that of Norway and Sicily, if somewhat below that of Fiji.

New Zealand. The Maoris carry us to the southern limit of the Polynesian race. The Maori population in 1906 was 25,538 males and 22,193 females. This includes 3938 half-breeds living as natives, and excludes 2578 half-breeds living as whites³. At the usual rate, therefore, we should not expect to find more than two to four living albinos among the Maoris. Among published reported cases we may note that: Dieffenbach⁴ in 1843 stated that "some of the natives have hair of a reddish or auburn colour and a very light coloured skin." He saw also "a perfect xanthous variety in a woman who had flaxen hair, white skin and blue eyes; not perhaps a half-caste, but a morbid variety, as was proved by the extreme sensibility of her visual

¹ *Gonzalez' Voyage to Easter Island*, 1770-1. Cambridge, 1908. Printed for the Hakluyt Society, pp. 135-6.

² See Bibl. No. 352, p. 306.

³ Letter of Mr Elsdon Best, Jan. 1908. Mr Best has contributed a number of interesting papers on the Maoris to the *Transactions of the New Zealand Institute*, including "Maori Marriage Customs" (read, 1903), Vol. 36.

⁴ See Bibl. No. 233.

organs, her rather pallid appearance and her age; on her cheeks the skin was rather rough and freckled." In 1869 Colenso mentioned that albinos, though rare, were sometimes born. They resembled the albinos of other nations in their weak reddish-pink eyes and light flaxen hair¹. In 1883 Finsch referred to a Maori woman he saw at Waikato, whom he at first mistook for a European; she had light blond hair, grey brown weak eyes and photophobia². In 1888 Gisbourne also stated that albinos are sometimes seen³.

As a result of enquiries by one of our number the following information has been obtained:

A half-caste guide at Rotorna, age about 50, who had been over the greater part of the Maori country, had seen only three albinos among the Maoris. The last one he saw was in the Napier district some twenty years ago, the hair was white or light yellow, skin fair, eyes red, and there was short-sight. The cousin of this guide knew an albino at Napier, and says that there were two albinos in one family of several members. The parents were dark; these albinos were from the Bay of Islands, and went to school at Napier: see our Fig. 340.

In New Zealand the health of the natives is cared for by a native Maori doctor, Dr Pomare, who has an English qualification, and is a sound man whose opinions and observations are thoroughly reliable⁴. He says that there are occasional albinos among the Maoris, who, as a nation, have dark olive skins with black eyes and hair. Native traditions state that when the Maoris first arrived from Polynesia 20 generations (500 years) ago, they found the New Zealand islands inhabited with a few feeble clans whose men they killed and whose women they married. The clans were some of them light coloured (presumably of a Caucasian origin), particularly one clan, which lived in the country to the west of Hawke Bay in the North Island. The Maoris who inhabit that part of the country to this day show numerous individuals with *red* hair, and among them albinos were not uncommon. But the natives have greatly diminished since the arrival of the "pakela" (white man), and Dr Pomare only knows of one albino living at the present moment, a woman of about 25 years. He considers that it will not be difficult to obtain her pedigree when next in that neighbourhood as the Maoris keep (or did keep before being degraded by the white) very complete oral traditions of their families⁵. Whatever stress may be laid on the tradition of a primitive white race, it is of interest to read that Maori traditions point to albinism as arising from a racial mixture; the association with a rufous race is also suggestive.

In January, 1908, in a letter to C. H. Usher, Mr Elsdon Best, of Whakatane, wrote:

"I regret to say that I cannot furnish any information as to albinos among the Maoris. I have heard of cases of albinism, but I have never come across any. They must be rare, I imagine, or I should have seen some in my wanderings of forty years. An albino is termed *Korako* by Maoris, while *Korakorako* were mythical beings,

¹ See Bibl. No. 314.

² See Bibl. No. 388.

³ See Bibl. No. 419.

⁴ Letter to E. Nettleship from Dr G. M. Scott of Wellington, March 17, 1908.

⁵ Letter of Dr Scott. No particulars of Dr Pomare's case have yet been received.

supposed to be white skinned, looked upon as demons, or beings of evil influence. I am leaving my camp to-night on a ride round the east coast, and will make enquiries anent *Korako*; should I gather any notes of interest I will forward to you."

In April, 1908, Mr Best wrote that he had not discovered any cases of albinism in his district, but the teacher in the local native school had told him of two albinos, brother and sister, living some years ago at Waima in the Hokianga district. Their names were Henare Hemara and Drapera Hemara, the female has since died; they had light yellow hair, light grey eyes, with quite Maori features and no European blood in their veins. These are the albinos of our Fig. 572; the portrait of the male albino and his family is given on Plate GG (103).

The Rev. T. G. Hammond, writing from Patea (Aug. 23, 1908) says that he knew Henare and his sister. Both were born of pure Maori parents, but their hair and skin are more yellow than white. The eyes are reddish and blink in ordinary sunlight; in the shade or a dull light they are like other eyes. Henare Hemara himself, in reply to a letter, furnishes the following through Mr Hugh R. W. Hamilton in a letter from Waikare Native School, Opuia, Bay of Islands (8th December, 1908): "Eyes move constantly, and are weak with a slight squint. Can see best at dusk, colour of eyes light hazel. Hair sandy coloured. His sister now dead was the only relation who resembled him. Hemara's skin, face and hands are much lighter than those of his young child, his wife or mother" (see Plate GG (103); the photograph also shows divergent strabismus, apparently of the right eye, and very marked photophobia). The Rev. T. G. Hammond reports that he has often seen a little boy, a pure Maori, with *very blue eyes*, which are a great contrast to his very brown skin, and mark him out among other Maori children; his father and mother are pure Maori. This boy is related to Henare, but Mr Hammond does not state the exact relationship. In all probability Henare's father and mother were nearly related to one another. The Maoris of these parts (Patea) say that the grandparents of Henare were taken away from Taranaki province by the Waikato warriors in one of their heathen raids, and were transferred from Waikato as slaves to Bay of Islands. These Maoris also claim that the father of Henare was a deified man, not an ordinary man, and that Henare and his sister are descended from the fairy people (*pateopaiarhe*). Maori legendary lore is full of reference to persons among their ancestors who could not endure the light of day, and only made journeys to the earth at night. In this there is possibly some reference to albinos. Mr Hammond was informed that there is also a Maori in the Bay of Islands with blue eyes. Of albinos Mr Hammond has only known three, these are Henare and his sister, and a woman of Parihaka, probably dead.

There is no conclusive evidence connecting the Napier albinos (Fig. 340) with the Hemaras (Fig. 572), or either set with the woman seen by Finsch. If albinos seem to the whites of New Zealand rare among the Maoris, we must remember that only 40,000 to 50,000 of these natives remain, and that this would only involve two to five albinos, if we granted the same frequency as we find elsewhere. It is satisfactory to have found such definite evidence, as we have, of albinism among such a scant population.

Australia. The exact relationship of the Australian natives to Melanesians and to dark Caucasians is not yet clear. They may be treated here as a group separate from both Melanesians and Polynesians. Widely different estimates of the native population have been given. In 1898 the population was said to be 100,000 but rapidly diminishing¹. In 1901, 47,296 were enumerated, but, including those living beyond the settled areas, the total aboriginal population was estimated at about 150,000². The Horn expedition found it difficult to form any estimate of their numbers in Central Australia. A population of these dimensions would at European rates give 6 to 10 albinos, and considering the enormous area over which it is scattered, and the wild and rather hostile character of some of the natives, it is not to be wondered at, if albinos are not readily met with. The relative possibilities of finding six individuals in 150,000 when those numbers are segregated together in a single town or small district and when they are scattered over a continent are not always realised by those who measure the rarity of albinism by the mere fact that they have not seen a case, or heard a report of a case. Further, it is not every person who is capable of recording a case of incomplete albinism, and in some such cases incomplete ocular albinism may escape all but the most carefully trained examiner.

Let us look first at the negative reports from Australia.

Brough Smyth, writing in 1878 of the aborigines of Victoria, says that he was not acquainted with a single case of albinism among the natives of Australia³. In Curr's *The Australian Race*, 1886⁴, it is stated that no instance of a native Australian albino had been seen or heard of. Lumholtz⁵ in 1889 remarks that as far as he knows albinos have never been discovered in Australia. In the Report of the Horn Scientific Expedition to Central Australia, 1896⁶, it is said: "No instance of albinism or of a condition approaching thereto was observed throughout the journey."

The absence of albinism in Australia seems to have been accepted as a fact up to 1890⁷. Yet even thus there are facts which might lead us to pause.

The Rev. J. Mathew says the new-born child of the Kabi tribe of South Queensland is singularly fair, but becomes gradually darker with age. [This is the case also with the negro, and possibly all dark races.] *Yellow hair was found in both South Queensland and in New South Wales, but it was rare and perhaps pathological, due to lack of colouring matter such as occurs in albinos.*

Even the Horn investigator writes: "Some of the children have very light tawny or almost tow-coloured hair, which is especially light coloured at the tips; it was not due to artificial bleaching, and was not frequently seen." Probably only a very careful examination of the eyes in the persons observed by Mathew and Stirling would enable us to ascertain whether the cases in question were really or not the incomplete albinism, which is so frequent in Malaysia, the Philippines and Polynesia.

We have received a number of reports as to the presence of albinism in Australia in answer to the wide-cast enquiries of C. H. Usher. In order to understand these—

¹ *Whitaker's Almanack*, 1898, p. 494.

³ See Bibl. No. 353.

⁶ See Bibl. No. 464.

⁴ See Bibl. No. 403.

⁷ See Bibl. No. 431.

² *Chambers' Encyclopaedia*.

⁵ See Bibl. No. 420.

abstracted below—it is desirable to put together at this point the albinos of whom we have heard :

(1) McPhee's albino. He came from the north of Western Australia, due west of Lagrange Bay. See our Fig. 592.

(2) The piccaninny from Maytown in North Queensland.

(3) "White Mary" from the Normanby River in North Queensland.

(4) "White Mary's" brother.

(5) Julius Brockman's albino boy from the southern branches of the De Grey River about 180 miles inland, Western Australia. The mouth of the De Grey River is in about Lat. 20° S.

(6) The albino at Victoria Downs Station on a branch of the Victoria River, Northern Territory. McPhee has also heard of a supposed female albino with the wild natives in the Northern Territory¹; it is not known whether these two reports refer to the same individual. We have most heartily to thank Dr A. P. Thom for pressing enquiries in a number of directions.

(1) In June, 1908, Dr Thom was informed by Mr Frank Wittenoom and Mr Duncan Macrae, who were squatters in North-West Australia, that a number of years ago, they had seen an adult male aboriginal who had red pupils, light hair and a fair skin. The skin was described by the one as lighter than that of a half-caste, and by the other as having a reddish tinge. He came from the Lagrange district, and later was taken south [by McPhee] to be shown.

Miss Daisy M. Bates in a letter to Dr Thom (Oct. 17, 1909) states that she had heard from a man, Cornell, who had lived for 20 years at Wallal (Ninety Mile Beach), that he had seen the albino, whom McPhee afterwards took to Melbourne; Cornell also stated that he had heard of a female albino resident east of Wallal. Miss Bates is engaged on a History of the aborigines for the West Australian Government. She has had no further cases of albinism reported to her and has seen none herself. She has not yet touched the interior of the state.

Mr Cowling, a trader, who has seen many of the native Australians, but no albinos, sends the following information in a letter of April 10, 1908 :

"I have visited nearly every camp on the coast from Cooktown and Cape York Peninsula, and down the Gulf of Carpentaria as far as Archer River; and in Western Australia from Cossack to King's Sound; I have been a good way north of King's Sound, but natives are rarely ever seen, being wild and hostile. I have seen the Port Essington natives."....."While in Western Australia 10 or 11 years ago I heard that a North-West squatter from the Condon district [McPhee] had taken an albino round to Melbourne with him on a trip."

It is thus clear that McPhee's albino was heard of before he appeared in Melbourne, and seen by squatters in his district. Further, Mr Wittenoom informs us that McPhee brought the albino down with his mother and other natives of the tribe about

¹ Letter to Dr A. P. Thom, Dec. 8, 1908. Dr Thom himself who during 14 years has been a good deal in the "back-blocks," and seen many of the aborigines of both Western Australia and Queensland, has never seen an albino.

200 miles to the coast, and as the mother had never seen the sea before, there seems little reason to doubt that his father, as stated, was a normal native. The *Melbourne Age* appears to have suggested that McPhee's albino might have been sired by a survivor of Leichardt's expedition, but he differed, as many observers noted, from an ordinary half-caste. For comparison on this point we have placed a normal native reproduced from Hutchinson's *Living Races of Man* along-side the photograph of the albino (see our Frontispiece). There can be little doubt that the photograph gives a full-blooded native.

A fourth man who had seen McPhee's albino, Mr S. F. Hymus, wrote in June, 1908, to Dr Thom, saying that he had seen an albino captured in the North-West interior 18 years ago by a man named Alexander McPhee. This native was taken to Melbourne and exhibited in the waxworks¹ of that city by McPhee. "His hair was very fair, and I should say white when a child, his skin was also a light colour, but different from that of a half-caste. They said his eyes were pink, but I do not remember taking notice of them."

A fifth eye-witness to McPhee's albino was Mr John G. Withnell, who, writing on July 5, 1908, to Dr Thom, from Western Australia, said "he was pronounced by all scientists to be an albino aboriginal of Australia." He was about 30 years of age when he saw him.

Mr McPhee himself, when written to, not only sent (Dec. 8, 1908) the photograph reproduced, but gave the following account in answer to enquiries. The albino was found in Lat. 20°, Long. 123°; the natives said that he was white; the colour of skin when seen by Mr McPhee was like a white man sunburnt, whiter than a half-caste, hair golden, lashes almost white, hair on other parts of body light sandy colour; eyes brown, the pupil being pink; no shaking or movement of eyes from side to side was noticed; no difficulty in standing the light of a bright sun. "The face and body were not lightened in any way, and the marks on chest were made by his tribe. This albino died about four years ago" [*i.e.* about 1904]. "When telling first of the white man in the interior the natives said 'all the same (as) white fellow only hair on body white,' meaning that most white men they had seen had dark hair on their bodies. The family consisted of the albino son and two black daughters. The father and mother were black. His hair on head and eyebrows flaxen, iris brown, pupils red; exceedingly complete whistlecock right down into the perineum²."

Dr Thom himself sums up the evidence: "Without actually seeing the alleged albino I don't think we can doubt the genuineness of McPhee's statements. Many people I have spoken to heard of McPhee's albino when he passed through" (Feb. 25, 1909).

The whole of this evidence, including even the absence of marked nystagmus and photophobia, and the not very conspicuous red reflex, is just what we should expect in an albino of this race, and it is not the sort of thing we should expect in a "fake" of any kind where the white hair and the photophobia³ would be certain to be

¹ The *Panopticum* of Melbourne in February, 1890. See Bibl. No. 431.

² Letters from Dr Thom, June 16, 1908, to Feb. 25, 1909.

³ See our Appendix, Fig. 405, p. 64.

emphasised. Our only reason for entering thus at length into the evidence is the fact that the existence of albinism in Australia is still denied.

(2) The first published notice of the Maytown piccaninny occurs in the weekly journal *The Colonies and India* for Oct. 1, 1890: "There is now with the blacks in Maytown a real albino child. The piccaninny is very fair with white hair and eyelashes, and is about six months old."

The medical officer at Cooktown, Mr Axel H. F. B. Kortum, gives the following information in a letter to Dr Thom (May 28, 1908):

"I have seen the piccaninny you refer to. . A white woman took the child from the gin, thinking it was a white child, and brought it to Cooktown and left soon afterwards for New South Wales.....The piccaninny died in Sydney, I believe, rather suddenly, being very delicate.....The child had white hair, a light skin, and light brown coloured eyes (if I recollect rightly about the colour of the eyes), nystagmus was well marked. Both parents were aboriginals; about their relationships it would be impossible to give any information."

(3) and (4) Dr Kortum also gave particulars of "White Mary." "Another albino living with the blacks at the Normanby River about 70 miles from here (Cooktown) was seen and attended by me on the 29th and 30th August, 1887, in the local hospital. She was known as White Mary, and years previously when seen on the coast was thought to be a white woman living with the blacks, and a boat was sent to rescue her. She was brought to town by the police on horseback, and delivered at the hospital in a sinking condition from falling on her head from a bucking horse as was reported. She had a light yellow skin, the hair and iris were of a light brown colour, nystagmus well marked. It was reported that she had a brother of the same light colour, who perished in a bush fire. They were well known at Butcher's Hill, a cattle station about 15 miles from the Normanby. It would be impossible to find out any family history about her, her tribe is supposed to be nearly extinct now."

(5) Dr Thom¹ also reports that a squatter named Julius Brockman, who knows the language and customs of the natives well, saw an albino boy, about eight years old, 20 years ago, on one of the southern branches of the De Grey River about 180 miles inland. The parents were black. He was a full-blooded native, and there were no other albinos in the family or country about.

(6) In the same letter Dr Thom reported the existence of the Victoria Downs Station albino. The manager of that station in a letter of March 17, 1909, replied to Dr Thom that he had heard the blacks speak of the existence of what might possibly be an albino away at the head of the Bains, 100 miles west of his station, but that he could not say whether there was truth in the statement, or that it was a superstition connected with their folklore. Mr McPhee, in his letter of Dec. 8, 1908, also reported a supposed female albino in the Northern Territory of South Australia, but without vouching for its truth. The two reports may refer to the same individual.

We now reach the more official views on albinism in Australia.

Dr W. E. Roth², formerly Protector of Aborigines in Queensland, states that he

¹ Letter of Feb. 25, 1909.

² Letter to Dr Thom, May 28, 1908.

has made many a weary search for alleged albinos in North Queensland, but on every occasion (some 7 or 8) that he found them, they turned out to be either a half-caste or "parasitic." He looked out for all physical peculiarities among the aborigines, but never found an albino native through North Queensland (including Cape York, the Gulf of Carpentaria and Torres Strait Islands). Furthermore he has only seen two cases of partial want of pigmentation—hands and feet.

Mr W. G. South¹, Protector of Aborigines, South Australia, feels sure there has never been an albino amongst the natives of South Australia, and he is doubtful if a case has ever occurred in Australia. He says that consanguineous marriages are forbidden by nearly all, if not all, native tribes in South Australia. J. B. Kennedy, M.D., Sub-protector of Aborigines in South Australia, who has resided for over 20 years in Central Australia and is acquainted with nearly all the aboriginal tribes, has never seen or heard of an albino aboriginal². H. Y. L. Brown, South Australian Government Geologist, who has travelled during many years in the back country (Western, Central and Northern Australia), Alfred Jearcy, late Government Collector of Customs for the Northern Territory and author of *In Tropical Seas*, and A. E. Martin, station owner, for many years resident in central parts of Northern Territory (stations between Lat. 20° to 30°, Long. 130° to 140°) and seeing in 20 years 2000 natives, have one and all never seen an albino.

Mr Henry Prinsep³, formerly Protector of Aborigines in Western Australia, has never heard of an albino among the natives except the alleged albino found by McPhee, which he never quite credited. But in the Gascoyne district about Miribza he saw several young natives who had almost fair hair, though he thought their eyes were dark. He was told by residents that the cause of this fair hair was bathing in salt water. He did not see any fair-haired adults, except young women. He never heard of an albino in the southern part of Western Australia.

Dr Thom, in a letter of June 11, 1909, says with regard to the supposed scarcity of albinos among the Australian aborigines that it may arise from the murder of albino children. The Government Inspector of the southern half of Western Australia, whose duty it is to see every black native possible, told him that half-caste children are nearly always killed at birth, and that this fact might militate against an albino being allowed to live⁴. Dr Thom had never heard before of children being murdered for this reason.

Having put before the reader so far the whole of the evidence we have been able to collect, we think with this evidence before us that the customary view that there is no albinism among Australian aborigines is incorrect. We think it must be accepted that albinism has occurred among them; certainly in Queensland [Cases (2), (3)

¹ Letter to Dr Thom, dated Adelaide, May 25, 1908.

² This and the following statement are from a letter of Mr M. F. Symons dated June 10, 1909.

³ Letter to Dr Thom, dated June 22, 1908.

⁴ Dr G. M. Scott, in a letter to E. Nettleship dated Wellington, New Zealand, March 17, 1908, says that he had lived in central Western Australia for five years but never saw an albino. Blacks, however, were not numerous and as infanticide is not unknown among them, it is quite possible that an albino infant would be destroyed.

and (4)], almost certainly in Western Australia [Cases (1) and (5)], and possibly in the Northern Territory.

American Indians. We must leave the anthropologists to settle whether the American Indians form an aberrant branch of the Mongolians, a fourth primary race of man, or if perchance Polynesian and Mongolian have in any way contributed to the establishment of these peoples. There exist at any rate some racial differences between the Indians of the extreme north and south of America, and some possibilities of rather marked racial intercrossings towards Central America.

(i) *Central America.* We have already referred to the tradition of an albino race in Central America, and the reports brought home by Vasca Nunez de Balboa and other early adventurers. We have cited the apparently truthful account of Wafer as to the Darien "White Indians," and the possibility that albinism was fairly frequent in the 17th century in this district (pp. 16—17). Montezuma, the Emperor of Mexico, had, according to Cortez, an apartment in his palace in which were men, women and children, whose faces, bodies and eyebrows were white from their birth¹. Of the existence of albinism among the American Indians of Mexico, we shall speak later, of modern data for the isthmus itself we have but little to report.

Dr Cullen in his *Isthmus of Darien Ship Canal*² of 1853 mentions two albino children on Perdon Island off Cape San Blas (see our Fig. 526). The island is not marked on two maps we have examined, but Point San Blas is the western extremity of the Gulf of Darien.

Further, just at the head of the gulf, Viguiers³ (1877) has studied the Indians of Paya. They are Cunas and belong to the great family of the Caribbeans. He saw only a single case of albinism. "The subject was a woman of middle age (*d'un certain âge*), whose eyes were red, the skin not absolutely light (*à peine plus claire*), and the hair red, mixed with white." Viguiers seems to have been uncertain of her complete albinism, but the redness of the eyes is probably decisive when we remember the red and yellow hair and the freckled skin of most dark-race albinos.

V. Forbin in a paper on a white negro⁴ also refers incidentally to the village of Paya. He says that he had been able to count there a dozen albinos in a population of 200 persons. The albino women did not like to leave their houses in bright daylight; the albino men went with their comrades to the chase, but appeared to be less skilful hunters than the others. He gives no personal details.

In Guatemala Otto Stoll⁵ observed (1878–83) three cases of albinism, one in a Quické Indian of Costa Grande and a second in a Cakchiquel from the neighbourhood of Antigua. In Antigua itself he observed a twelve-year-old albinotic Ladino girl. Such albinos are termed by the Indians and Ladinos "Hijos del sol," or "children of the sun."

This is the total of the scanty information we have been able to obtain as to

¹ See Bibl. No. 14, p. 122.

² See Bibl. No. 255, p. 74.

³ See Bibl. No. 348, p. 412.

⁴ *La Nature*, 37^e année, p. 384, Paris, 1909.

⁵ See Bibl. No. 402, p. 299.

Central American albinos. We refer elsewhere to the "spotted Indians" of Tehuantepec¹.

(ii) *South America*. The notices are very scattered and insufficient.

Martius² (1867) speaking about the Parvilhana in Brazil says that "Kakerlaken" or albinos, deaf-mutes and imbeciles occur, and that they are sympathetically treated (*rücksichtsvoll behandelt*). He gives no further details.

Brown and Lidstone, in their Amazon journey of 1878³ report that on going ashore at a village a few miles up the Tapajos branch of the Amazon they saw some boys playing, "among whom we noticed a lad who, at first sight, seemed to belong to one of the fairest complexioned races of Europe, but on a closer approach he turned out to be that singular variety—an albino Indian. He was shy, however, and shunned our observation."

Porte⁴ (1872) mentions three cases of Indian albinos, the first about 18 years old, the second about 25, and the third 50. They had "la peau blanche très-tachée de lentigines, les cheveux blancs et droits. Les yeux étaient rougeâtres chez deux d'entre eux et bleu clair chez la troisième." The two first were observed at the town of the Barra do Rio Negro⁵, and the third was rowing a boat at Ega⁶ on the upper Amazon. We have already referred to Porte's statement that the Indians of Pacaja were reported to be almost white and had blue eyes (see our p. 18).

Margrave, in 1658⁷, speaking of the inhabitants of Brazil, mentions an albino youth of 18 years, of extreme white hair, eyebrows and skin, but as he adds "naso plane more Aethiopum, qui natus hic e patre et matre nigratio," it is not clear that he does not mean the offspring of African slaves. When he speaks, however, of a rufous female negro albino, he says *Africanam feminam*. He specifies no district of Brazil.

The Chevalier de Pinto⁸ cited by Robertson (1777), observes with a like indefiniteness: "that in the interior parts of Brazil he had been informed that some persons resembling the white people of Darien have been found; but that the breed did not continue, and their children became like other Americans. This race, however, is very imperfectly known." Von Spix and Martius in their travels in Brazil (1817—1820) state that: "All the Indians of the tribes of Paris, Coropos and Corvados whom we saw here [at Gindswald on the Rio Xipotó] had an extraordinary resemblance.....it is very rare to find among them albinos or any that are dark spotted⁹."

A. D'Orbigny in his *L'Homme Américain*, 1839, p. 84, says that in spite of all his local enquiries he only twice found cases of albinism, the first among the Moscos and the second among the Patagons, and of these he was only definitely certain of the first. D'Orbigny records, however, a spotted condition of the body occurring in almost

¹ See Bibl. Nos. 260 and 413.

² See Bibl. No. 307.

³ See Bibl. No. 351.

⁴ See Bibl. No. 327.

⁵ On the equator to extreme N. of Brazil.

⁶ ? Ega about Lat. 65°, Long. 4° S.

⁷ See Bibl. No. 25.

⁸ See Bibl. No. 84, Vol. XLVI., p. 301 and p. 462.

⁹ See Bibl. No. 167, p. 239. It is, perhaps, rather stretching the evidence of this passage to state as Lagleyze does, that von Spix saw "quelques albinos" among the Corvados: see Bibl. No. 552, p. 11.

all the individuals of the "nations mocétanès, tacanas et yuracarès." These spots were almost white, irregular, and appeared on all parts of the body and members, but particularly upon the "parties saillantes des articulations." They had no appearance of disease, the skin being as smooth on the spots as elsewhere. As, however, the children had not these spots, D'Orbigny considered that they must be the result of cutaneous affections. He holds that it was very noteworthy that "trois nations" should present simultaneously this anomaly¹. It is probable that this is the same spotted condition which has been noticed by Tylor and Charnaz (see our Chapter on the albinotic Skin) in the *Pintos*, and may be due to a widespread tendency to leucoderma, a tendency which is possibly hereditary.

On the whole we must conclude that a thorough study of albinism among the South American Indians has yet to be made. Besides vague statements as to its existence, we have only the records of four or five cases, not one of which is adequately described, although there is enough evidence to show that it may affect the eyes as well as hair and skin.

(iii) *North America*. Owing to the labours of the Ethnological Bureau of the Smithsonian Institute we have more details as to the North American Indians than as to those of Central or Southern America, but even here no special study has been made of albinism for its own sake, and we have therefore no adequate account, especially of the eyes, of these Indian albinos. Of Canadian Indians our knowledge is still less.

Poole remarks²: "It is a common error, common throughout the American continent even, to imagine that the aborigines of Canada and British Columbia are black. We are called whites to make a distinction, but in reality the natural skin which prevails in most of the tribes is nearly as white as ours.....Another error concerns the colour of the hair. No doubt it is usually dark, but the shade differs greatly. I saw a whole family or section of a tribe on the British Columbian mainland, every one of whom had not only a clean white skin, but light silky hair. On Queen Charlotte Island there were numberless instances of auburn tresses and a few positively of golden curls, amongst which Klue's little Klootchman daughter was conspicuous."

Coming further south we have already cited at length (see our p. 19) Catlin's account of a blond Indian tribe on the Upper Missouri, and the apparent occurrence of albinism in relation to it. Now it is not possible without further information to say how far the individuals observed by Poole and Catlin were of an albinotic character, but superficially they bear much resemblance to the light skinned, golden haired, blue eyed type of albino we have found in nearly all dark races, and samples of which actually occur among the Indians in the Mexican districts. The occurrence in considerable numbers of albinos in these Mexican districts is of much interest. As early as 1848 Emory³ reported albinos in New Mexico: "Near the head waters of the Salinas...there is an Indian tribe called Soones [? Zuñi]...many of them are albinos, which may be the consequence of their cavernous dwellings, and may also have given

¹ See Bibl. No. 225.

² See *Queen Charlotte's Islands*, etc. 1872, p. 315.

³ See Bibl. No. 244. Cf. the cave albino of Hartman cited on the following page, and the 'troglodyte' albino tradition: see our pp. 25 and 68.

rise to the report of a race of white Indians in that quarter." Oskar Loew saw in Arizona among dark Indians a white skinned, blue eyed child¹.

Bourke, in his Report on the medicine men of the Apache, 1887—8, thus indirectly refers to albinos²: "Among many savage or barbarous peoples of the world albinos have been reserved for the priestly office. There are many well marked examples of albinism among the Pueblos of New Mexico and Arizona, especially among the Zufii and Jusayans, but in no case did I learn that the individuals thus distinguished were accredited with power not ascribable to them under ordinary circumstances. Amongst the Cheyennes I saw one family, all of whose members had the crown lock white. They were not medicine men, neither were any of the members of the single albino family among the Navajo in 1881."

We think Bourke has exaggerated the extent to which albinos have been raised to the priestly office, although there is the recorded negro case of Battell and Ogilby. It is tantalising to miss the pedigree of an Indian white-lock or flare family, which might have been placed beside our English and negro cases, and particulars of the other albinos would have been of the greatest value.

Hartman³ gives us (1894) a more extensive account of an albino Indian woman he saw on the Fuerte river which flows into the Gulf of California on the west coast of Mexico:

"In one of the barrancas on the Fuerte river until a few years ago there lived about 30 Tarahumares that were perfect albinos. The small-pox swept them away except one, an old woman, whom, after much trouble, I succeeded in tracking out. I visited her in her cave on the very crest of a mountain 3000 feet high near Morelos. She was married to a small dark man, and looked very strange in his company. Her features were of course purely Indian, but a complexion like hers I never saw in Mexico even amongst the white people. She looked almost like a very blond type of Scandinavian or Irish peasant woman, with her whitish yellow hair and pure white long eyebrows; the face, naked arms, breast and legs being white skinned but with big rose-coloured spots caused by the scorching sunlight. The eyes were more than half-closed, and as the woman was very shy she would not allow me to approach so near, that I could distinguish the colour of her pupils [? irides]. I was, however, assured that they were bluish. It was only after having spent half-a-day on the spot and treating the cave-people very liberally that I succeeded in obtaining the souvenirs I desired—different hair-samples of the albino woman. In earlier times the custom of sacrificing such albinos to the gods prevailed in Mexico."

Here, again, we have no definite account of the eyes, but there seems evidence of photophobia. No authority for the last statement is given.

In 1876 the *Baltimore Sun* newspaper stated that in Arizona the Zuñis held albinos as slaves and that they only married among themselves, with what result we do not know⁴.

¹ Cited by Poesche (Bibl. No. 381), but he gives incorrect locus: see Bibl. No. 363.

² See Bibl. No. 606, p. 460.

³ See Bibl. No. 607, pp. 128–9.

⁴ Quoted for Poesche (Bibl. No. 381). The stock of the *Sun* (Bibl. No. 342) has been destroyed by fire.

In 1889 H. ten Kate stated that the Zuñis stood physically below the other Indian tribes of south-west America. "Scrofula, Rachitis often occur, and, as is well known, forms of Albinism and Hermaphroditism. The infant mortality is relatively great." He gives no further details¹.

In 1904 in a Report on the Zuñi Indians² we have a more detailed account by Mrs Matilda C. Stevenson of the Zuñi albinos and the photograph taken in 1879 by Mr Stevenson of six of these albinos is by kind permission of the Smithsonian Institute reproduced as our Plate FF. The photograph shows the photophobia; the apparently darker parts of some of the faces are, we were told on enquiry, solely due to a shadow cast on the group. It is a misfortune that the albinos were not taken in a better light and along-side normally pigmented individuals.

The following is Mrs Stevenson's account:

"In 1879 seven albinos were found among the Zuñis—Mr Stevenson, with difficulty, gathered six of the albinos in a group and secured a photograph of them. The mother of an infant albino could not be prevailed upon to allow her child to be photographed. Indeed, these people are so sensitive of their condition that they avoid the presence of strangers, and while the men may stand their ground, the women and children, especially the latter, flee from the 'Americans.' The writer has seen several of the children grow to girlhood and womanhood. A birth of an albino child occurred in 1896. These people have light, decidedly yellowish, hair and complexions of decided delicacy. They all have weak eyes, and their vision is so affected by the absence of choroid pigment that they are obliged to protect their eyes, which always become inflamed from ordinary daylight. When out of doors the albino men wear hats when they can be secured, and the women cover their faces with blankets and peep through the smallest openings. The statement that albinos are compelled to live apart from the others of the tribe is erroneous, and none of them are debarred from religious or social privileges. In no instance has an albino parent an albino child, and no two of them belong to the same family. The adults are each married to a dark-haired Indian, and they have healthy offspring.....The several albinos who were examined showed nothing abnormal in their measurements." Light skin, yellow hair, and poor sight are referred to, but there is no mention of whether or no the pupils were red.

Quite recently Hrdlička in his *Physiological and Medical Observations among the Indians of South-western U.S. and Northern Mexico*³ has given us the most complete account so far published of Indian albinism. He states that he has seen 24 complete albinos: 8 ♂ adult, 5 ♂ children, 6 ♀ adult, 5 ♀ children. He found partial defects of pigment in 16 cases, 13 ♂, 3 ♀, of whom 15 were adults, there being one child, a male. It is not easy from the data given by Hrdlička to be sure of the total population examined for albinism. The list of numbers of the various Indian tribes amounts to 70,000, which would, reckoning only Hrdlička's complete albinos, give about one albino per 3000 normals; Hrdlička says that the Indians were somewhat over

¹ "Ethnographische u. Anthropologische Mittheilungen aus dem amerikanischen Südwesten und aus Mexico," *Zeitschrift für Ethnologie*, Bd. XXI. S. 667, Berlin, 1889.

² See Bibl. No. 517.

³ See Bibl. No. 577.

100,000; this does not seem to agree with the population list on pp. 5—6, but would give about one albino per 4000. If we take the tribes, as to which the question of the existence of albinism seems to have been asked, they number 23,000, and this would give one albino per 1000 normals. Whichever estimate is taken the frequency of albinism seems rather large.

Speaking of the Mexican Indians Hrdlička considers that albinos are few. Light hair, skin and eyes are said to occur among the Mayo. Hrdlička heard of an albino among the Navaho, another at Isleta, and saw a woman, aged 50, a partial albino with yellow hair, but moderately brown skin among the southern Ute. He met with a case of "vitiligo" [*?leucoderma*] in a male Papago of 55 years. Four full-blood Mohave girls at Fort Mohave school had "lighter but not quite vitiligo-like spots on the exposed portions of the otherwise normal looking skin."

Among the Hopi were seen 3 ♂, 8 ♀ albinos and among the Zuñi 3 ♂, 3 ♀ albinos. Of these 17 albinos there were 9 children and 8 adults. To what extent they were identical with Stevenson's cases does not appear. Hrdlička says they were all complete albinos, but of slightly differing shades; there was no instance of partial albinism (p. 293). If "complete albinism" be taken to cover only cases with red pupils and red reflex of iris, it will be evident later that Hrdlička's Indians were rather "incomplete" than "complete." The skin of these Indian albinos was of ordinary texture, but more sensitive to exposure; it was pink or white with a slight flush, and exposed parts subjected to the sun discoloured like sunburn among whites. On the body the skin looked absolutely normal; on the face, neck and hands in adults it was rather redundant and wrinkled in folds¹. The lips were exfoliated, cracked and sore. The hair ranged from unbleached flax fibre, pale yellowish, through various shades of yellowish and brownish—always with a slight golden lustre—to medium brown. In no instance was there any trace of red in the hair². Eyebrows and eyelashes were as a rule lighter and in some cases practically colourless. The consistency and quality of the hair were like those of other members of the tribe.

The eyes were light gray or light blue to moderate gray-blue; very much like the eyes of similar shades in blond white people. In no case was the iris colourless with pink reflection as in the albino rabbit³. In every instance more or less marked nystagmus and photophobia were recorded. Vision was not strong, but shortsightedness was not noticed. We must regret that no ophthalmoscopic examination of the eye appears to have been made. The irides of complete albinos in man are not generally "colourless with pink reflection"; the blue or gray iris is the rule in albinos (see our Chapter I, p. 7 n.), and it is only colourless in the sense that there is an absence of pigment. There is no possibility of ascertaining from the above description whether the choroid and fundus were completely or incompletely albinotic, and if the absence of a red pupil is to be taken as meaning that they were not albinotic, it is not clear why Hrdlička

¹ Cf. the Australian albino in the frontispiece and the Fijian albinos on Plate U and the Negro albino, Plate Y (80).

² Viguiet (see our p. 104) seems to have come across a red-haired Indian albino.

³ Viguiet and Porte both seem to have met Indian albinos with red pupils, so that condition is not unknown among the Indian albinos. A casual observer might easily describe the present authors' albino dogs as possessing "blue eyes," if he did not examine them in the light needful to show the red reflection.

speaks of these Indians as complete albinos. If the eyes were incompletely albinotic, then these Indian albinos correspond exactly to the albinos we have noticed among Papuans, Filipinos and negroes, i.e. a light-skinned, yellow-haired blue-eyed albino, who suffers only in a minor degree from defective vision.

Very full anthropometric measurements taken by Hrdlička and published in his memoir show no differentiation on those of full-coloured Indians of the same tribes, but the strength as measured by a dynamometer was less. Pulse, respiration and temperature were the same as in normals. There were no signs of scrofula, congenital syphilis or rachitis.

Through the courtesy of the Smithsonian Institute we are able to give photographs of two views of each of two of these albinos; see our Plate NN (125)—(128). The lighting has not been wholly satisfactory, and there is no normal native photographed on the same plates, but the illustrations bring out some of the points referred to above. The family histories are reproduced in our Figs. 579—590, but they are very incomplete, and we are compelled to question at some points their accuracy.

Hrdlička says that albinos are not ostracized or looked upon as inferiors; they are called among the Hopi *kolokochate* = white people. They marry full-coloured natives, but are ashamed of their condition, sensitive, bashful and irritable; they are also slightly submedium in intelligence. Among the Zuñi and Hopi there is considerable intermarriage of distant relatives, but the clan system prevents close interbreeding, and certainly there is not as much of it as among tribes having smaller numbers, but no albinos.

While there is in the facts collected above enough evidence to show that albinism in the American Indians occurs as frequently as (and perhaps more frequently than) in other dark races, and exhibits the same general characters, yet we feel that a thorough study of albinism in these races, especially with regard to albinism of the eyes, and the frequency of albinism generally in the Canadian and South American races would be of peculiar value. Having regard to the statements of Poole, Catlin and Porte, a general pigmentation survey of the American Indians with special reference to the asserted blondism of some northern and southern tribes could hardly fail to be of great ethnological interest, not only for the sources of albinism, but for the evolution and differentiation of the Indian race and its subtypes. The occurrence of albinism with a relatively rather high degree of frequency in Arizona and Mexico, and its special features are quite in keeping with the early reports of it due to Cortez and Wafer.

Eskimo. The classification of the Eskimo is still a moot point of anthropology. It is generally recognised that the bulk of the aboriginal people of America probably came from Eastern Asia *via* Alaska to the western world. The Eskimo scattered from Greenland to Behring Strait, have been attributed to Alaskan and Asiatic origin. The Koryaks of North-eastern Asia, according to Nordenskiöld, appear to be a link between Mongols, Eskimo and North American Indians. The little we have to note of the Eskimo may therefore well appear at this point. That little is of a purely negative character; we have been unable to discover an Eskimo albino. Enquiries were made on our behalf by Dr Souter among the Dundee Whalers. Captain T. Robertson (S.W. "Scotia," Oct. 7, 1909), writes that he has never seen anything

like an albino among the Eskimo, he has never even seen a fair Eskimo. Captain H. M^cKay (Coral Bank, Tayport, Oct. 18, 1909), says that, in his experience of the Arctic, he has never come across any albinos, nor have any other of the whaling fraternity whom he knows. He finds it impossible to state how many Eskimo he has met with, because they are birds of passage, and the various tribes are continually on the move, they often split up into sections, and with the exception of the headmen, with whom the whalers come into personal contact, it is impossible to say whether the remainder form the same body of individuals or not. Thus eight years ago Captain M^cKay took a young Eskimo, who had been to this country, back to Cape Kater, but he has not seen him since, although he has repeatedly been there. The lad, he heard, had moved on with a portion of his tribe and their places had been taken by natives coming south. Thus 70 to 100 fresh individuals may be seen at the same place every year, and it is not possible to form any estimate of the total population observed. Both Captains Robertson and M^cKay have been many years at the Greenland whaling. Their evidence, however, does not prove, considering the rarity of albinism in man, that Eskimo albinos do not occur¹.

SECTION III.

Albinism in Black-skinned Races.

The present section is devoted to the African negro. In using the term "black-skinned" races we are fully conscious that it is not correct. We recognise a great variety of shades in the negro himself, but the term is convenient as a broad distinction between the races under discussion and the white races on the one hand and the yellow and red races on the other. At the same time we avoid the term negro or negroid, which might be taken to include certain races of the Pacific already dealt with in Section II. We recognise that skin-colour is not a safe racial distinction and that whatever primary races there may have been, there are now so many subdivisions and so many mixtures due to crossings and selections that no satisfactory classification can be at present attempted. The broad categories, Caucasian, Mongolian and Negroid, helpful as they are in some respects, would have forced us from the geographical arrangement, which we believe to be especially suggestive in the case of albinism, and would have left us with no definite position for the mixed population at the boundaries, where it is possible that albinism may be most frequent. Our skin-colour divisions have been taken to cover roughly (i) Europe and the Mediterranean basin, (ii) Asia with Polynesia, Australia and America, and lastly (iii) Africa. This division is rough and full of inconsistencies; we recognise the Bushmen as yellow-red and yet negroes; the Somalis may be black and not negroid; the Semites may be olive or yellow skinned; the Australians almost black and yet possibly Caucasian. We do not wish to express any views on the thorny

¹ Mr David Houston, who has been employed by the Hudson Bay Company for five years at York factory at the mouth of the Nelson river, and at Churchill on Hudson Bay, believes that he has seen more than 1000 Indians of the Cree and Chippewah tribes, and from 300 to 400 Eskimo; he has never seen nor heard of an albino amongst them.

problems of race in man. For convenience of treatment we have divided our material into three sections, which represent roughly and with marked exceptions and deviations three grades of skin colour.

We have already (pp. 12—15) when dealing with the *Leucoaethiopes* referred to the great range of colour in the negro, and cited Pruner Bey¹, Sir Richard Burton², Collignon and Schweinfurth as bringing evidence on this point³. Other evidence of a relatively light African race is given by Maurice Delafosse in 1893⁴. He cites Admiral Fleuriot de Langle⁵ as follows: "A white population, to which the people of Biribi give the name *Pai-Pi-Bri*, has its abode on the river north of the lagoon of Ylé; the *Pai-Pi-Bri* are probably the same as the tribes which the English missionaries of Cape Mesurado and Cape Palmas [Liberia] speak of under the name of *Paw*, and which they say are of a light colour."

The Admiral also mentions the report of a female slave originally from the Upper Niger, which stated that between this river and the Ivory Coast were white tribes connected with the "Touareg."

Captain Binger⁶, who has travelled from the Niger to the Gulf of Guinea through the country of the Kong and the Mossi considers these tales doubtful, and holds that the *Pai-Pi-Bri* are either a slightly lighter tribe than their neighbours, or a people among whom albinism is frequent and exists in an endemic state.

Delafosse draws attention to the type of negro albino we discuss below with the hair of beard and head, blond, red or chestnut, the eyes blue and the skin of very light brown or more often speckled with entirely white spots, and suggest they have been the origin of the *Pai-Pi-Bri* legend. He says that this name signifies in "grébo"

¹ Pruner Bey's paper (see Bibl. No. 273) is a remarkably suggestive one. Pp. 81—89 deal with the variation of colour in the same race. Pp. 90—109 are, however, of special interest at the present time, for they put together exceptions to the usual experience of skin colour where black and white races cross. Some of these cases are of doubtful authenticity, and of rather ancient date, but they are all suggestive of the sort of points which medical men and others living among the dark races might usefully inquire into. One point deserves special notice here, namely in Paraguay, where the mixture of Indian and Spaniard is more complete than elsewhere. The children of these dark-haired races have often fair or even red hair (p. 98). All evidence of blondism resulting from segregation following the crossing of dark races is peculiarly valuable in considering the sources of albinism.

² "In Accra," writes Burton, "I saw a second anthropological curiosity. Albinos have been seen by almost every African traveller but not semi-albinos. My specimen was a man with the pronounced formation of face and skull peculiar to our "poor black brother." His colour was however *café au lait*, hair dull yellow but short and woolly as belongs to his race. The colour of the eyes was bright brown. Later on in Benin I saw several of these individuals one of whom was even the chieftain Sandy at Botanga." (See Bibl. No. 293, p. 156.)

³ Other writers who bear witness to the great range of colour are F. Stuhlman (*Mit Emin Pascha im Herz von Afrika*, Berlin, 1894, S. 173, 378, 386, 532, 558, 745, 765, 805, etc.); P. Paulitschke (*Beiträge zur Ethnographie und Anthropologie der Somäl, Galla und Hararî*, Leipzig, 1886, S. 1—10, 23, 68, 70) and Franz Hultet (*Wanderungen u. Forschungen im Nord-Hinterland von Kamerun*, Brand-schweiz, 1902, S. 261, 320, 321, 329—330).

⁴ See Bibl. No. 439.

⁵ *Croisières à la côte occidentale d'Afrique, tour du monde*, 1873.

⁶ *Du Niger au Golfe de Guinée par le pays de Kong et le Mossi*, Paris, 1892, T. 2.

the "country of the whites," and has been actually given by the "Grébo" of Biribi to the negroes living between the rivers San Pedro and Lahu (Ivory Coast). Delafosse remarks "that the characters mentioned above which are the criterion of negro albinism were found among several of those who were temporarily our hosts; these latter were for the most part natives of Great Drawin and Little Drawin, two commercial stations on the Ivory Coast between the mouths of the San Pedro and San André rivers. These traces of albinism are still more frequent among their compatriots of the interior. Their true name is 'Agni.' The name Pai-Pi-Bri is an appellation of foreign origin, as I have said above, which most of the Agni repudiate or ignore, and which applies only to a fraction of their large family" (p. 403).

It is interesting to compare this tale of the Pai-Pi-Bri with that of the Leucoaethiopes which were located in a not widely different part of Africa, and probably had the same origin, the blondism or incomplete albinism of some negro-races.

At a much earlier date (1816) Walckenaer¹ had drawn attention to similar cases on the Congo:

"Les naturels de Congo, quoique noirs comme les nègres de Sénégal, semblent former, cependant, une race différente² et se rapprocher, par les traits, des Européens; ils ont quelquefois les cheveux d'un brun rougeâtre, et les yeux d'un verd foncé ou couleur de mer."

Collignon³, who cites the above passages, notes that Dybowski had shown to the Paris Anthropological Society photographs of Akoas from the Congo, and that the hair of these "négrilles" was relatively light, being of an auburn red and not black like that of most negroes, and the eyes of a fairly light yellow tone (*un ton jaune moyen clair*) instead of the dark chestnut eyes (*marrons foncées*) of the latter.

There is no statement as to the skin tint in these cases, and the variation of the eye-colour appears to be considerable. But they will prepare the reader for the existence of a type which will be frequently referred to below, the xanthous negro. There may be no wholly xanthous tribes such as the traditional Leucoaethiopes and the Pai-Pi-Bri, but there are tribes or districts in which xanthism is not uncommon, and it is met with from the Ivory Coast to Uganda, and from Uganda to Portuguese East Africa. This type is essentially important for our consideration of albinism, for it appears to occur not only in the same districts but even in the same stocks as albinism. Pritchard was, we believe, the first to insist on the importance of the xanthous negro; the most complete account we are able to present of the type has been provided for us by Dr G. A. Turner, Medical Officer of the Witwatersrand Native Labour Association, whose duties bring him into touch with natives of many tribes in large numbers. The difficulty about illustrating xanthism by photography is that the xanthous negro possesses a red or yellowish red skin, and that this as well as the red, brown, or even yellowish hair tends to photograph black,

¹ See Bibl. No. 157.

² Dr Crewdson Benington of the Biometric Laboratory has recently been studying the Congo skull and finds it definitely differentiated from the Negro; see also the remarks cited below of Dr Mercier Gamble on the natives of the Portuguese Congo.

³ See Bibl. No. 449.

and it is exceedingly difficult by ordinary photography to show the distinction, which is so obvious and marked to the actual observer between the black and xanthous types¹. We have endeavoured to give something of the tint of the xanthous negro on Plate CC, the reader should compare it with the normal tint of the negro in Plate AA (85) and the tint of the albino negro in Plate BB. On Plate κ specimen S₆ gives the hair of the xanthous negro; D₂, D₃, and D₄ are the wool of albino negroes, while the hair of the normal negro is as black as the Fijian hair A₁. Dr G. A. Turner gives us the following facts as to xanthism in negroes². The skin is of a brown colour, the beard and moustache are also brown. In a few cases he had examined the wool on the scalp was black, but that on the pubes was brown. The most marked example of this he had seen occurred in a native from the northern part of the Nyassa Coast line. The subject of our Plate CC was Jappe a well-developed Myambaam of about 25 years of age; of very light almost white colour. His skin has more the healthy colour of a European somewhat sunburnt, not the deadly white colour of the pure albino. The iris in this as in other cases was brown. The wool on head, slight moustache and beard, and pubic covering were of brown colour. There were no signs of eczema on the skin, no nystagmus, but a marked squint. The pedigree given in our Fig. 441, is a most interesting and suggestive one. I. 1, his paternal grandfather, a normal black, married I. 2, an albino negress, the offspring was Jappe's father, a xanthous negro, who married a "white Kaffir" (*i.e.* as Dr Turner reports on special inquiry another albino negress), Jappe resulted from this union and he himself marrying a normal black negress has two xanthous children. That the offspring of albinotic and normal negroes are usually either black or albinotic may at once be admitted, but this pedigree seems to show that the dominance of black is not always complete, and that there is a relation between albinism and xanthism which is not without suggestiveness.

In Magūmānē (Plate HH (105)) we have another case of xanthism provided by Dr Turner³, and we have endeavoured to show the distinction between this Mtyopi and an ordinary native, although the contrast has been much reduced by reproduction. Magūmānē (No. 30745 W. N. L. A.) came from Changuine in Portuguese East Africa; he was aged about 20. The wool on his head was brown, lighter over the forehead; eyelashes and eyebrows brown; hair on back light brown; pubic hairs brown, skin rich red, no eczema. Iris dark brown, no nystagmus. Father and mother and all brothers and sisters black; just married himself, at present no children. No record of any albino relatives.

¹ Xanthism, as distinguished from albinism, is not peculiar to the negro. We have already noted it in Dr Fraser's Tamil cases (Fig. 486). In that instance the photographs also showed no distinction, that it was possible without treatment of the original to reproduce in the plate, and we had to abandon the idea of illustration. Dr Turner in a letter to K. Pearson (Jan. 11, 1909) says that he has tried photographs of xanthous negroes in all lights, but never with any success. We have suggested to him the use of a colour screen when photographing a black and a xanthous negro side by side.

² By kind permission of the University of Aberdeen Anat. and Anthropol. Society.

³ Letter to C. H. Usher, Nov. 15, 1908.

A third case of xanthism is provided by Dr Turner¹ in Sanone (W. N. L. A., No. 18,213) a Mtyopi from the Zaralla district, aged about 20. His skin was a light rich red colour; eyebrows and lashes reddish brown, wool on head brown taking a light golden (hydroxyl) tint on top of scalp, pubic hairs brown, light brown hairs over lumbar regions and buttocks; eyes brown, no nystagmus or squint. The father was a pure black Mtyopi, the mother of the same red colour as Sanone. No account of xanthism or albinism in any relatives except the mother. The brothers and sisters are all black. Dr Turner remarks that the morals of the Amatyopi are peculiar. A man may lend his wife to some man to raise seed for him, and this man may have had xanthous or albinotic relatives. This the offspring are not likely to know anything about, and thus family history is not worth much. The photographs sent "do not show up the colour at all well" (Dr Turner) but indicate the absence of any mixed blood.

Besides the xanthous type, the albinotic type and the partially albinotic type of which we shall see many examples in the sequel Dr Turner² refers to "another peculiar type now in my compound; he is not a pure albino, but he cannot be called a case of xanthism; he has pure white spots, of no great extent; but he has large areas, covered with what may be described as a white background on which have been implanted numbers of *black* freckles, I will if possible get a photograph of him, and will make notes and forward them."

This type seems comparable with the spotted freckled albinos of Fiji, New Guinea and Nyassaland (see our Plates U, X and Y (180)), but the condition in this case is associated with *partial* albinism.

Frequency of Negro Xanthism. Dr Turner has most kindly sent us the following statistics as to the frequency of xanthism³.

Boys examined specially for evidence of Xanthism.

Tribe	No.	Xanthous	Albinotic	White patch on body	White patch on genitals
Mtyopi	996	2	—	1	1
Shangaan	2200	4	1 ⁴	3	2
Myambaam	1385	2	—	—	4
Delagoa Bay	171	1	—	—	—
South of lat. 22° S. ...	4752	9	1	4	7
Mahua	833	—	—	—	—
Quelimane.....	55	1	—	—	—
Nyassa	26	—	—	—	—
Agawa	1214	1	—	—	—
Angoni	100	—	—	—	—
Anganga	109	—	—	—	—
North of lat. 22° S. ...	2337	2	0	0	0
Total.....	7089	11	1	4	7

¹ Letter to Professor Reid of Aberdeen, July 19, 1908.

² Letter to K. Pearson, Jan. 11, 1909.

³ Letters to C. H. Usher, dated Johannesburg, Nov. 22 and 25, 1909.

⁴ This boy, besides being an albino, had enlarged mammary glands, though he was apparently otherwise normal in his sexual organs.

Thus out of a total of 7089, 23 showed some colour peculiarities. The one albino present was not a perfectly complete case, but he was far too light to be classed as xanthous. Albino infants are, however, often killed and albinos are unlikely to seek work on the mines, if they can get a chance of existing elsewhere. The numbers as Dr Turner remarks are too small to be reliable, but there is some evidence of more pigment variation in the southern than in the northern districts, and we may seek an explanation possibly in the lessened need of pigment as we move further from the equator. At the same time other factors must be taken into account, (i) the more southern tribes have been longer and closer in contact with the whites and infanticide may therefore be more rare, (ii) the longer journey and the less knowledge of the possibilities of rejection or ridicule may well prevent the xanthous members of the more northern tribes going to the mines.

Dr Turner provides the following table of details concerning these xanthous cases, which may be profitably compared with our table of albinism in the Philippine Islands (p. 70). The first two boys were described before records of normal individuals were made and so do not appear in the first table above.

Dr Turner adds the further remark that the boys showing evidence of xanthism have he thinks more often a fully developed beard and moustache than the full negro. On the other hand he considers that the pure albino has less hair or wool than the normal¹. While making the examinations tabled above Dr Turner was struck by the number of boys who had light hair, or rather, down, on the temples, though the rest of the body was pure black. He accordingly examined a gang of 486 boys for this special feature with the following results:

Tribe	No.	Light hair on temples	Percentage
Central African	169	2	1.1
Shangaan	128	15	10.9
Myambaam	142	5	3.5
Mtyopi	34	1	2.9
Delagoa Bay	13	1	7.7
Total.....	486	24	4.9

While little stress can be laid on the smaller groups, this result appears to confirm the previous view that the southern boys show more signs of a lighter pigmentation.

The fact that one of the first signs of a lighter pigmentation is this fluff of a less dark colour on the temples should be taken in conjunction with the "flare" which is

¹ There is a good deal of evidence to show special hairiness, at any rate in albinos of non-negro races. But absence of hair is noted by Mollien and Raffinel in negro albinos: see our pp. 126 and 127. Dr Stannus finds, however, increased hairiness, see p. 147.

Extract of Notes on 13 Boys showing evidence of Xanthism.

	1	2	3	4	5	6	7	8	9	10	11	12	13
Tribes	Mtyopi	Yao	Mtyopi	Shangaan	Mtyopi	Mtyopi	Shangaan	Myambaam	Myambaam ¹	Mtyopi	Shangaan	Shangaan ²	Delagoa Bay ³
Comp. No.	2480	—	3552	3558	3905	4312	4312	5305	5554	5854	5955	5790	6153
Age	—	30 years.	—	—	—	—	—	30 years.	—	18 years.	30 years.	25 years.	21 years.
Wool of head	Dirty brown.	Dirty dark brown.	Dirty dark brown.	Black.	Black.	Black.	Black.	Black.	Black.	Brown.	Brown.	Dark brown, hair at back of neck light brown.	Black with tinge of brown.
Hair of temples...	Brown.	Brown.	Light brown, reddish.	Brown.	—	Brown.	Brown.	Brown.	Brown.	Brown.	Brown.	Very light brown.	Brown.
Eyebrows	Brown.	Reddish.	Nearly black, have brown tinge.	Black.	Dark brown.	Brown.	Black.	Black, tinge of brown.	—	Dark brown.	Brown.	Dark brown.	Black.
Eyelashes	Brown.	Reddish.	Ditto.	Black.	Dark brown.	Brown.	Dark brown, nearly black.	Ditto.	—	Brown.	Brown.	Dark brown.	Black.
Eyes	Brown.	Brown.	Dark brown.	Light brown.	Brown.	Brown.	Brown.	Brown.	Very dark brown.	Brown.	Dark brown.	Very light brown.	Dark brown.
Nystagmus	Absent.	Present.	Absent.	Absent.	Absent.	Absent.	Absent.	Absent.	Absent.	Absent.	Absent.	Absent.	Absent.
Moustache	—	—	Brown.	Slight, black.	Dark brown, well grown.	Black, big.	Copious, brown tinge in black.	Slight, brown.	Brown, full.	Commencing, red.	Light brown.	None.	Slight, brown.
Beard ⁴	—	—	Black with streaks of brown.	Slight, black.	Dark brown, well grown.	Black, big.	Ditto, ditto.	Slight, black.	Full, darker than moustache.	Absent.	—	Scanty, brown.	Slight, dark brown.
Hair on back ...	Brown.	Brown.	Brown.	Brown.	Brown.	Brown.	Brown.	Brown.	Brown.	Brown.	Brown.	Light brown.	Light brown.
Hair on pubes ⁵ ...	Brown.	Brown.	Black.	Black.	—	—	—	Brown.	—	Dark brown.	—	Dark brown.	Brown.
Skin	Light tawny.	Red.	Dull red.	Reddish	Light tawny.	Red.	Brown.	Reddish brown.	Brown.	Red.	Red.	Very light yellowish brown.	Light brown.

¹ Had dark brown hair on chest.

² No family histories were obtainable which were of the slightest value, except in the case of Shangaan 5790. This boy said that both his mother and father were of the same colour as himself, he said he had no sisters, but two uterine brothers, the one absent in Mashonaland, the other I saw, he was a pure black negro with an exceptionally black skin and well developed black beard. I also saw two other brothers by another mother, who were also pure black negroes. He stated that the brother in Mashonaland was the same colour as himself. Personally I do not think much reliance can be placed even on this family history.

³ Glans penis, pink colour of a European.

⁴ When speaking of a slight, brown beard or moustache, I use the word slight to signify that there was only a small beard, not that it was slightly brown.

⁵ It must be remembered that many natives pull out all pubic hairs, so that notes cannot be taken in many cases.

so frequent in piebalds and occurs occasionally in cases of leucoderma, and again with the white lock or tuft on the temples of some cases of partial albinism.

. A second point dealt with specially by Dr Turner and concerning which he emphasises the need for suspended judgment is the white patch on the *glans penis* of many natives. He notices as other observers (see our p. 123) that the glans of the uncircumcised negro is usually of a pink colour, and that of the circumcised is black, so that the glans becomes pigmented after the operation. It is possible that the white glans may be in some instances a result of treatment at circumcision, for a boiling styptic is poured by some operators over the raw parts directly after circumcision (see our Chapters on albinism and leucosis of skin for effect of scalding). This, however, is not the universal practice. Among the 1214 Agawa and 833 Mahua in Dr Turner's first table (p. 116) none had a white glans and the majority were circumcised; but this might only point to different operators having different methods of stopping the bleeding. On the other hand 2 out of 2200 Shangaans had white genital patches and these boys were uncircumcised. Dr Turner examined (Nov. 25, 1909) 179 Mahua boys from Mozambique as to this point and found five had a dead white coloured glans penis. Three of these five said they were born like that; a fourth said it was because he was newly circumcised, and one, who was uncircumcised and had a white internal lining to his foreskin as well as a white glans penis said that the white colour came on after a disease called *bupa*, which a police boy told Dr Turner was syphilis. Dr Turner, however, states that the boy showed no evidence of syphilis, and he was fairly certain that this boy had never had it. So far the evidence is inconclusive and we must suspend judgment until Dr Turner has been able to make further inquiries.

When we pass to the actual negro albino we shall find that in some respects there are marked divergences from the European albino, and close links with the albino of other dark-skinned races. While in certain individuals we meet with absolutely white hair, the general colour of the hair is yellow as indicated on Plate κ , D_2 , D_3 , D_6 . Further, red pupils and red reflex through the iris are not universal. The iris is often described as light "yellow,"—a tint found by some European observers as peculiarly unpleasant; elsewhere it is said to be blue without red reflex, or grey to light brown. How far the absence of the red reflex is due to a denser iris and not to presence of pigment will hardly be settled until dissections have been made of negro albino eyes. But the evidence points to a considerable range of type in the eye of the negro albino. Further, while photophobia, nystagmus and myopia are recorded in many negro cases they do not appear to be so general as in the European albino. Lastly with regard to the skin, while eczema, and blistering owing to sunburn are frequently noted, and we are often told of the "lead-white" or dead-white of the skins of negro albinos, we hear also of pink and white, European-like, complexions and of an absence of any special skin tenderness. It may be that we are more readily able in a black-skinned race to trace the various lesser grades of albinism, or it may be that the albinos of such races actually exhibit more graduations. In either case they deserve careful study, because the appearance of these xanthous and albinotic types in the dark races,—types for which

the loss of pigment does not seem seriously to handicap the variant—are not without suggestiveness for the evolution of the races of man¹.

¹ We do not propose to describe at length the amusing discussions abounding in early notices of negro albinism (see for example Maupertius, Bibl. No. 58, Demanet, Bibl. No. 71) as to whether Adam was black or white in colour. The general view was that as the negro race could produce a blond type they must have had white ancestors to whom these mutations were a reversion. But while Adam has ceased to have much interest for any branch of science but folk-lore, we have our own modern problem of the origin of man by a single or manifold descent. If all existing races have sprung from a single primitive type of man or man-like being, was that type of a fair or a dark skin? Now we see every day mutations in the form of blondism occurring among the dark-skinned races, but never a case of a dark-skinned offspring to white parents. In some even recent works reference is made to the birth of a black child to white parents, but in no case where we have really been able to follow up the evidence is it deserving of the least credence. The incident of the birth of a black child to white parents carries one into many of the byways of literature. The authority given for one case is Aristotle. He certainly mentions (see our Fig. 504) a black baby which the white daughter of a white woman bore to a white man, but the point of his tale is that the husband of the white woman and the father of the white daughter was an Aethiops. The same tale appears to be that of Plutarch (*De sera numinis vindicta*, cap. 21) “and a certain Greek woman having borne a black child, then being on her trial for adultery discovered herself as being descended from an Aethiop in the fourth generation,” i.e. her grandfather was a black. A second tale is due to Albrecht (*Ephemeridum Germanicarum med. phys.* Dec. II. An. VI. p. 39), who relates that a woman gave birth to a black child just after her house had been blown down by gunpowder and she had been made as black as a coal. The child only lived a few hours. Now a genuine dark-skinned baby would be red and not black for some days after birth, and the medical examination which asserted the blackness of the child is quite consistent with its being a direct effect of the gunpowder. A third tale appears in Paré (see Bibl. No. 19) who describes how a princess was accused of adultery because she had given birth to a black child, and was acquitted on the pleading of Hippocrates of “maternal impression.” No such tale can be found in the writings of or about Hippocrates. But St Augustine (*Quest. 93 in Genes.*) does state that in the works of Hippocrates it is mentioned that a woman bore a very beautiful child unlike herself or the father, and that the medical man freed her from a charge of adultery by pointing out that the child resembled a picture in her bed-chamber. Now St Jerome in commenting on the same passage of Genesis, i.e. that of Jacob and the rods, Genesis xxx. 32 and 33 (see *Liber Hebraicarum Questionum in Genesim*, ed. Migne, T. XXIII. p. 985) after referring to maternal impression, states that Quintilian had freed a matron, charged with adultery, for having given birth to an Aethiopian, on the ground of maternal impression. Erasmus editing Jerome and probably intending to add a footnote, falsely inserted into the text St Augustine’s tale of Hippocrates. Thus Hippocrates was fathered with the black baby tale which Jerome attributes to Quintilian, owing to Paré misreading or confusing the “Aethiopem” and the “pulcherrimum puerum.” From Paré the tale has persisted through a long line of gynaecological writings down to the present day. But even Jerome was wrong, Quintilian has nothing to do with the black baby! In the period of Roman decadence, the Roman ladies had, or at any rate were accused of having, relations with their slaves, black and other, and the Roman satirists make the charge against them of giving birth to black babies (see Juvenal, *Satire* VI. l. 600 ed. Lewis, 1882, Vol. I. p. 96; Martial VI. xxxix. 6—7). Hence the attack and defence of the woman charged with adultery for giving birth to a black baby became a popular subject for declamations, and such an oratorical exercise has been preserved for us in the *Declamationes* of Calpurnius Flaccus often attached to the works of Quintilian (*Declamationes majores*, Lugd. Bat. 1720, p. 794. Natus Aethiops). The tale of Hippocrates and the black baby soon became widespread. Gemma, *Lib.* I. cap. 6 copied Paré (he gives an additional tale about a woman who bore three sons at the time of the Epiphany, one being like one of the three kings, black!); Schenk, *Observat. Medic.* Lib. 4, Obs. 1, pp. 543—4, copied Gemma; Wanley, *Wonders of the Little World*, 1678, Bk. II. pp. 95—6 copied Schenk. Fienus, *De viribus imaginationis Tractatus*, Ques. XIII. p. 111, gives the Quintilian

With regard to the theory (discussed in a later chapter) of albinism as an arrest of development it will be of advantage to refer here to the state of pigmentation of the negro at birth. The facts we know about it are of peculiar suggestiveness, when we remember that "black baby to white parents" legends invariably state that the baby has been born black! The negro baby is born in colour almost like the white baby, and the dark colour is not apparent in the skin of the negro embryo.

Schreber¹ in 1775 was among the first to note that the just born negro is of a reddish colour, "Yet one sees on those who have brown or black parents evidence of brown or black on the nails and genitals; and they soon become yellow, as white babies usually do, and in time, from one to several months, black."

An early but careful observer, Dr Thomas Winterbottom², writes in 1803: "It is worthy of observation that negro children are nearly as fair as Europeans at birth and do not acquire their colour until several days have elapsed. The eyes of new born negro children are also of a light colour and preserve somewhat of a bluish tinge for several days after birth. The palms of the hands and the soles of the feet are nearly as white as in Europeans and sometimes so through life."

Camper³ in 1782 noted that the negro child at birth was of a reddish colour, then first became black around the rim of the nails and the nipples, on the third day the genitals become coloured and on the fifth or sixth day the whole body. Camper observed this on the male child of a negress born in Amsterdam in a closed room in the winter, and not exposed to the sun, the body being closely wrapped in swaddling

tale, so also L. Caelius Rhodiginus, *Lectioinum antiquarum Libri xxx.* Lib. xx. cap. 15 and thence a flood of minor writers until the tale becomes accepted as a record of a black baby from white parents. For scientific purposes all such evidence is worthless.

Another phase of the subject, the birth of children from whites with a large or small black or dark area, sometimes attributed to maternal impression, *i.e.* from a negro, are just possibly worthy of some consideration; the dark area is most probably an extensive mole. On this point the curious reader may be referred to Pechlin's case (Bibl. No. 47, also sometimes cited from Kundmann, Bibl. No. 56, as a case of black born to whites! *e.g.* Schmidt, Bibl. No. 131, p. 30), Meck'ren's case (Bibl. No. 37), and in particular for an almost certain "mole" case to Wells' account in 1818 of a "Female of the White Race of Mankind, part of whose skin resembles that of a Negro" (Bibl. No. 162); Buffon (see *Oeuvres complètes*, Paris, 1818, T. v. p. 365) also gives the case of a girl, Anne Marie Hérig, showing multiple hairy pigmented moles. A more recent case is described by E. N. M. Ross, *Brit. Med. Journ.*, 1909, Vol. i. p. 1416. The above notes only indicate a small portion of the material we have sifted with regard to the "black baby from white parents" legend—other instances are possibly cases of "Vagabond's Disease" (see Bibl. No. 112, for an early case of this reported in 1789 by Loschge, where the hands, feet and face of a tramp were white and the rest of the body black; a piece of the Aethiopic skin of this beggar was possibly in Blumenbach's museum: see Bibl. No. 125, p. 158; Loschge failed to find any category for this white "darker than many negroes": cf. R. Crocker, *Diseases of the Skin*, 3rd ed. p. 1301. Dr Crocker most kindly classed Loschge's case for us)—but without entering further into the matter we conclude that there is no reliable evidence for the birth of a dark-skinned child from white parents. If the black had arisen by mutation from the white, we might expect an occasional repetition of such an occurrence; but we do not meet with it, and the origin of the white from a dark-skinned ancestor, by a xanthous or semi-albinotic stage seems not only possible, but probable. It is in keeping with what we know of light variants in mammals and birds: see our chapter on Albinism in Animals.

¹ See Bibl. No. 79, p. 9.

² See Bibl. No. 136, Vol. i. p. 189.

³ See Bibl. No. 94, pp. 43—44.

clothes, yet notwithstanding the colour changed as indicated above. He also exhibited at one of his lectures (p. 43, *loc. cit.*) the prematurely born child of an Angola negress and of an equally black father, which had a perfectly white body to prove "dass die Kinder in Mutterleibe nicht schwarz sind wie Strabo dafür hielte¹."

Buffon also knew of the stages in pigment development of the negro baby².

Berchon³ in 1860 confirms these early statements. He remarks that there is no more distinctive colour in negro new born children than in white children, and at this age one might easily be deceived as to what the colour would become. The skin colour is red but not uniform in tint, being darker at the nape of the neck, the groins and the perineum. The skin according to him becomes black very rapidly, in a few days,—a statement not wholly agreeing with those of other writers.

Vogt⁴ in his *Vorlesungen über den Menschen*, 1863, after noting the red colour of the new born negro baby remarks that it is mixed with nutty brown, and less vivid red than that of the white child; it varies, however, in different parts of the body. It becomes slate-grey and more or less quickly, according to the district, changes to the parental colour. In the Sudan the development of the colour is usually complete in a year; in Egypt it is only complete in three years. The hair of the negro child is rather chestnut-brown than black, is straight and only lightly curled at the end. These points are also vouched for by Pruner Bey, and are of importance with regard to the origin of xanthism.

Darwin (*Descent of Man*, 2nd ed., pp. 557 and 604) repeats the like statements.

Falkenstein⁵ (1877) in his discussion on the skin in the tropics has some remarks in the section on *Leucopathia* upon the new born negro. After mentioning the normal want of pigment on the palms and soles of the adult negro, he notices that this want of pigment extends to the whole skin in the case of the new born: "Das Kind kommt, wie bekannt, mit einem bräunlichen Rosa, das es wenig von einem Weissen Kinde unterscheiden lassen würde, zur Welt, wenn nicht an einzelnen wechselnden Stellen sich Pigment abzulagern begonnen hätte. In einem Falle fand sich solches am Nabel, an der Ohrmuschel, Brustwarze und Nagelfalz, während auch Stirn, Oberlippe und Rücken ein schmutziges Grau durchschimmern liessen. In diesem Falle war auch das Auge nicht blau, wie meist angegeben wird, sondern braun. Die Pigmentirung erfolgt sehr schnell und ist in sechs bis acht Wochen vollendet."

In the first birth Falkenstein saw he thought the mother had given birth to a mulatto and was only convinced of his error, when the child in six weeks became a perfect negro (*Die Loango Expedition*, 1873—76. Leipzig, 1879. Abth. II. S. 34—5).

Collignon gives, with the Broca scale tints, an interesting account of three births,

¹ Waitz, in 1863, quotes Camper and adds: "Children born in the cold season take a longer time in becoming black. The children of the Arabs in the south, even when they have not intermixed with the negroes, but have their colour, exhibit at birth a copper colour; whilst those of the American race are at birth a yellowish-white or reddish-brown colour. Those of the native Australians in the environs of Adelaide are immediately after birth of a yellowish-brown, and only become dark at a later period" (see Bibl. No. 292, p. 99). These statements need confirmation.

² See *Histoire naturelle de l'homme, Oeuvres complètes*, Paris, 1818, T. v. p. 285.

³ See Bibl. No. 275, p. 520.

⁴ See Bibl. No. 290, p. 238.

⁵ See Bibl. No. 350.

two negro and one Annamite (*Bull. Soc. d'Anthrop.* Paris, 1895, T. 6, pp. 687—91). He notes a foundation of disseminated pigment, pale lilac as in a newly shaven black beard; ears and genitals perceptibly dark.

It cannot be said that the pigment in the negro baby first deposits itself in regions which would countenance our asserting that partial and spotted albinos are cases of "arrested development"¹ of later date than in the case of the complete albino. Absence of pigment round navel and nipples and on the genitals and forehead are occurrences in partial albinism².

Lastly we have to thank Dr Henry Strachan³ for some very interesting details as to pigment in the negro and negro hybrids. He writes:

"As to the colour of the newly born negro; the fact that immediately after birth the skin pigmentation is so slight as to be hardly noticeable is so well known to doctors who attend black women in child-birth, that I can hardly understand how any belief to the contrary could obtain⁴. I, after my 26 years study of the negro (and his various 'descendants' of differing degree of colour due to crossing with the white race) in the West Indies and West Africa can have no doubt on the point. The darkening begins immediately after birth, but it takes some days—about a fortnight—for blackness to be established, while several more weeks pass before the complete full normal degree of blackness of the negro is attained⁵. This does not refer to the skin of the genitals which is always black."... "The skin of negroes is darker in exposed regions than in those always covered (I again except the genitals⁶), and 'coloured' people who leave the Tropics and live for some time in—say—England, become distinctly fairer than they were before: this is very noticeable on their return to their birthplace, where one can contrast their colour with their

¹ See chapter on Albinotic Skin.

² See chapter on Partial Albinism.

³ Letter to E. Nettleship dated August 14, 1908.

⁴ We think the consensus of opinion is distinctly on the side of the absence of marked pigmentation in the new born negro. We have only received one opinion to the contrary, or, perhaps, it would be more correct to say, one other account of the apparent lightness of negro babies at birth. Dr G. H. Pooley writes to E. Nettleship, under date Nov. 2, 1906: "I was not present at more than two or three confinements but I saw many very young babies. All, even those I saw born, were *black*. The skin being much thinner the pink of the blood vessels is much more clearly seen, and the epidermis being smooth does not refract light in the same way that the skin of an old negro does. If a baby is very blanched, *i.e.* like a white baby, at birth, the thinner skin makes it look a dirty ashy grey, but *the black is there all the time*, even in stillborn babes the blackness of the skin is unmistakeable. In Goanese, *i.e.* mixed Portuguese and Asiatic Arians, the babes are a dark terra cotta at birth. The colour of a negro baby is more that of black satin hung over a red lamp." Dr A. Brown of Nyassaland says that the new born infants are of a pinkish yellow, and could not be mistaken for European infants; the scrotum is always dark.

⁵ Felkin (*Proc. R. S. Edin.* Vol. XIII. p. 706, Edin. 1886), says that the Waganda children are decidedly lighter at birth, but at about *three years* of age correspond in colour with their parents.

⁶ The negro is phimosed to an extreme degree as a racial peculiarity. The *glans penis* beneath the phimosed prepuce is *red*. In the circumcised negro races of the west coast of Africa (Zambas and many S. Nigerian tribes) the *glans* is as *black* as the rest of the organ; and blackening soon follows surgical circumcision in the uncircumcised races (Krūs, etc.) and in West Indian negroes. All negro Mohammedans are, of course, circumcised and have black *glandes*.

country-men's and their own previous tint. The previous degree of pigmentation soon however returns after residence in the Tropics is resumed¹."

"This remark applies especially to coloured people². The interesting point about these 'fair'³ people is that the skin of the genitals—especially the penis and scrotum—is extremely pigmented; the greater the amount of the black strain, the greater the degree of blackness in these parts. Since it is the rule in the white races that the genital skin is the most pigmented of the body, it is not surprising that in 'coloured' people it should be black or very dark brown."

It is worthy of notice that these parts—nipples and genitals—which attain pigmentation earliest and apparently fullest in the negro appear peculiarly liable in his case to be pigmentless in those cases of partial negro albinism which will be discussed in our chapter on Partial Albinism.

The above sections will possibly have sufficed to show the reader that the negro is not born markedly pigmented but acquires pigmentation, that his pigmentation is not equally intense and is liable to be affected by mode of life and possibly climate. Further, that there are considerable variations in negro pigmentation as we pass from one race to a second, and within a single race individuals may arise with marked defects of normal pigment, and yet be far from albinotic. Whether it is possible to draw a rigid line between the xanthous and incompletely albinotic negroes, and between the incompletely and completely albinotic negroes, and between the partial albino and the spotted freckled albino, or between the latter and the complete albino yet remains to be seen. There are many cases of a transitional kind, and at present we have had no proper investigation of the eyes of "blue" eyed or "light yellow" eyed negroes. For purposes of rough classification, however, we may divide these albinotic negroes into the classes: (i) the xanthous negro, (ii) the complete albino with possible subclasses or perhaps separate divisions, (iii) the spotted freckled negro, (iv) the yellow eyed white skinned negro and (v) the blue eyed white skinned negro with photophobia and nystagmus, but not red pupils. The divisions (iv) and (v) may be incomplete albinism as far as the eye is concerned. (vi) The partial albino, or piebald negro. This class will be dealt with separately in our chapter on Partial Albinism, and will be only briefly referred to under Geographical Distribution.

¹ Dr J. Costa informs one of the writers of this monograph that the more cultured and civilised the negro the less deep his colour.

² The word "coloured" is not used in the West Indies in the same sense as in the United States. It is only used in relation to persons of mixed "black" and "white" blood, and not to the blacks as in the United States. Various degrees of "colour" are recognised in the West Indies and Spanish America; the chief being: *Sambo*, *Mulatto*, *Quadroon*, *Octoroon*, *Mustee*, *Mustafina*, and "White by Law." The latter phrase is interesting. It takes us back to the times of slavery, when admixture of "black blood," however slight, brought with it not only social but legal disabilities, and loss of certain privileges enjoyed by the humblest "white." Hence a law was passed to benefit those whose infinitesimal amount of "black blood" could only be detected by a knowledge of their genealogy. They therefore became "white by law." The term is of course now obsolete and known only to the student of the subject.

³ The word "fair" is technically used in the West Indies to indicate persons of mixed blood beyond the mulatto, *e.g.* quadroon, octoroon, etc.

In reference to these divisions Class (i) has already been described at length. We may take our portrait of Jappe (Plate CC) as a type case. Of Class (ii) our plates provide good examples. Dr Ward's Zulu albinos with *quite white hair*, greyish blue irides, *red pupils*, slow lateral nystagmus, photophobia and pink skin *without dark spots* are excellent illustrations (see Figs. 37, 38 and Plate AA (86)). Of Class (iii) Dr Stannus' Nyassaland albino Ng'ombe with his spotted skin where exposed to sun, light straw-coloured hair, photophobia, nystagmus, but only partial albinism of the eyes is a good case (see Fig. 427 and Plate Y (80)). He is, as far as his eyes are concerned, a transition to Class (iv), which again is well represented by Dr Stannus' albino girl Chesiwandivi (see Fig. 430, Plate Y (70)), who with pink skin, light straw-coloured hair, has orange pigment in the iris, and notwithstanding nystagmus and photophobia. Dr Mercier Gamble's blue-eyed, pink-skinned, fair-curved albino baby, from the Congo (Plate EE (98) and (99)) may serve to illustrate Class (v), but many such blue eyed negro albinos will be referred to below. Of Class (vi) minor illustrations occur in our Plates H (21), AA (85) and HH (106) and (107); major illustrations, complete piebalds, in our Plates E, F, and G.

Geographical Distribution. A. **Negro Albinism in Africa.** We have already referred to albinos among the peoples of Northern Africa, thus to the case from Fezzan¹ (see our p. 47, footnote). Baudoin in his journey to the Bêlad-el-Djerid (Long. 7° to 8° E., Lat. 33·5°—34° N.) encountered albinos at several places: 1° at Ouled-Neil individuals with white skin, blond hair and "red eyes"; 2° at Souf a native with posterior part of his trunk and his shoulders of milk whiteness (? leucoderma); 3° at Tahibet negroes with "red eyes" and spotted black and white as a regular chequer board. These probably were spotted freckled albinos as in our Plate Y (80), Fig. 427. If they were piebalds with red pupils they would have very special importance, but the evidence is too slight to justify this view (cf. p. 131). They were told by their compatriots that if they were in the land of the Christians, one would use their skin to extract the poison. On the whole there is a rather singular absence of reports as to albinism among the Berbers.

We have cited early evidence of albinism in Abyssinia (see our p. 48) and shall return later to Somaliland.

It is however not till we get to the southern limit of the Berber tribes, to the edge where they meet Sudanese negroes, that references to albinism become frequent. We may start therefore on the West Coast at this line and pass downwards.

(i) *Cape Verde Islands.* Neveu Lemaire gives a most interesting case of hereditary partial albinism from the capital Praya of this archipelago². It will be found described in our Fig. 513.

(ii) *Senegal and the French Sudan.* We find it not always easy to locate the

¹ The interest of Rohlf's views is the stress he lays like Schweinfurth and Burton on the appearance of blond and albinotic varieties from the crossing of "der weissen Berber Nord-afrikas mit den schwarzen Aethiopiern des mittlern Afrika"; see Bibl. No. 332 § 154.

² Bibl. No. 490. J. Atkins (*Abrégé de l'Histoire des Voyages*, La Harpe T. III. p. 4) is said to have seen "yellow negroes" in this district (see Bibl. No. 256, p. 283). We have been unable to verify the reference. Cornaz treats them as albinos; they may have been xanthous negroes or the light section of the Foulah race. Atkins does mention a bright yellow man on the Gold Coast: see our p. 130.

places mentioned by early travellers as the map of Africa and its divisions have changed much in the last twenty years. We shall therefore content ourselves by throwing together such cases as we have been able to find from Senegal, Senegambia and the French Sudan.

As early as 1789 Pruneau de Pommegorge¹ expressed the opinion that there was no body or nation of white negroes. The cases that were to be found on the coast of Guinea were so few in number, that those who have lived there for long only knew of one or two places where this freak of nature was to be found; thus, at Bisseau and in the highlands of Galam, where a very black father and mother had had four or five white living children. One was sent from Galam to Senegal and was still alive in 1750, employed as a working carpenter. This white negro was said to be very hideous; his skin was white like plaster and very rough, his eyes trembled, and his woolly hair was almost reddish. He was extremely stupid, although he spoke a little French and worked at his trade.

Mollien² in his travels on the Senegal and Gambia in 1818 reports that at Poukon, a village close to the Sama, a tributary of the Senegal, they brought him "a young albiness," to see what effect would be produced by her appearance. "She had neither eye-brows nor eyelashes³, her colour was a chalky white; her eyes could scarcely bear the light of the sun; her hair and her features resembled those of the negroes; she walked slowly, her whole exterior indicated a state of debility and ill-health. I was therefore much surprised to hear that the blacks marry these women and that they bear children. I was assured that when united to men of their own colour the offspring of this union are as white as themselves⁴. The sight of such a child whom they presented to me, excited in one an emotion of pity which the spectators mistook for a feeling of horror. 'If,' said one of them, 'thou beholdest beings of the same race as thyself with disgust, be not astonished that we should dislike thy colour.'"

Mage⁵ in his travels in the Western Sudan (Senegambia and Niger) published in 1868, says that the village of Kouroundingkoto presented him with the spectacle of a white negro or albino. It was a child of seven or eight years, very well built; the hair was almost white, but the eyes were not red. His body was of a very pale yellow, but he was repulsive to look at, the features of his face which were those of a negro passing badly with this sickly white colour. He had a terrified unhappy look, precocious wrinkles and the very coarse grain of his skin increased his ugliness. "Since then I have often seen albinos some entirely white, others spotted white and black, and I have always remarked the same thing with regard to their skin and the expression of their face. If one adds to this, that they are generally sunburnt, which marks them with red and makes their skin peel, one will allow that their appearance is far from agreeable."

Going further inland to Bakel we have Anne Raffenel's⁶ account of an albino

¹ See Bibl. No. 115.

² See Bibl. No. 161, p. 258.

³ See for example the case reported by Raffenel from Kasson and given on our p. 127.

⁴ This is one of the few cases in which we have found reference to albino mated with albino: see our p. 128.

⁵ See Bibl. No. 309.

⁶ See Bibl. No. 240.

negro in 1846 (see our Fig. 515). He was a Foulah¹ of Kasson; he had the colour of a European, who had been exposed to the hot sun; the hair of head and beard was red; the features were negro even to exaggeration; he had upon his skin and especially that of the face, a large number of black spots, mingled with spots of red²; the eyes were almost without eyelashes, and what there was of them was very fine and of very light colour; the eyes were greenish, and the white of the eyes more dead than with the normal negro. According to Raffene! the albino lives without working, and what pleases him he asks for with the certainty that it will not be refused. The normal native gives to the albinos in order to win indulgence and favour from heaven. God does not wish the albinos to work like other men, the negroes say, and therefore He has given them the colour of the whites.

Three further albinos from the Sudan were described by Raffene! a few years later (1856)³. The first was a Malinkié youth of about 16, seen at Koghé. His hair brown or dark chestnut, was rather curled like that of some blond European than woolly as the normal negro; it had a light reddish tinge. His colour was leaden and face slightly wrinkled. Raffene! compares his skin to that of an unripe lemon. His eyes were dark brown, and not sensitive to light, nor had they the red reflex⁴. It will, I think, be clear that this negro was really of the xanthous type.

The second albino was a boy of 10: "Il réunissait tous les caractères connus de l'albinisme." There was photophobia and the eyes showed red reflex; the colour of the eyes was difficult to determine, but it appeared brown or slate-grey, the eyelids were held half-closed; the hair was white and woolly, but not rough like that of most negro children; the skin was very white, and the cheeks rosy. His skin presented furrows, sores and roughnesses due to the action of the sun. He was also Malinkié.

The third albino was a female child of 18 to 20 months. It was of Bamboukie origin, and of dead white colour; it had extreme photophobia and only opened its eyes furtively; they were light blue, but they did not appear to have a red reflex like those of the boy.

A fourth albino, a woman, was seen by Raffene!⁵ at Sambougon. She was 20 to 25 years of age, dressed as a negress with national tattooing on her face and breast. The skin was crisp and burnt by the sun without peeling notably; it was of a colour approaching red. Her swollen eyelids were closed on her sunken eyes and opened with an appearance of pain. The eye was light brown with a reddish reflection. Her hair was red and frizzy; the features negro; and she was excessively ugly.

¹ Raffene! especially states that this man belonged to the genuine negro branch of the Foulahs. Another section of them is very light. Thus Mungo Park describes the Foulahs as chiefly of a tawny complexion with soft silky hair, and in an appendix to Park's work Major James Rennell even identifies the Leucoaethiopes of Pliny and Ptolemy with the Foulahs (pp. 15 and 57).

² He is described by Raffene! as "l'homme pie de Cuvier."

³ See Bibl. No. 259, p. 227.

⁴ Raffene! speaks as if the eyes must have originally been red, but had now lost their red reflex and photophobia, but we think this depends on his theory of progressive change in albinos.

⁵ See Bibl. No. 259, p. 273.

It will thus be seen that in the five albinos, reported for that day fairly carefully by Raffeneil, we have a considerable range of negro albinism comprising our Classes (i) to (v). This author also gives us some general account of negro albinism¹. Those of his men, who had travelled much, reported that it was not rare in the interior of Africa, notably among the Foulahs; further he says that albinos experience remarkable changes with age. Thus, when born, negro albinos have very white and silky hair, rosy complexion, skin of a pale white and extreme sensitiveness, which shows itself by chaps and boils; they have inflamed eyelids, red or azure blue pupils and photophobia. Progressively the following changes take place: the hair preserves a woolly look, stiffens, and from white becomes dark brown approaching red; the complexion becomes leaden and the skin yellow, losing its sensitiveness; the eyes pass to grey, dark blue or brown, and their photophobia is much diminished. It would be interesting to know how far this is due to a change of pigmentation or to increased density and opacity of parts. Raffeneil apparently gives the changes on the authority of his men. He does not refer to the development of spots, which we have good evidence for.

His men told him of several married albinos and assured him that they had no posterity, but this assertion was later denied in a most authentic manner by a Mohammedan negro. He assured Raffeneil that he had seen an albino woman give birth to two children, of whom one was like its mother and the other like its father, a negro. Another traveller told Raffeneil that in Upper Gambia he had seen a negress who brought four children into the world at two births—the two first were albinos, the two others blacks. Raffeneil heard of no marriage of two albinos. The word for albino in the Foulah tongue is, he says, *danédio*², a word meaning white colour, they are not called by the name of *toulako*, meaning white man. When albinos are free, they “live on charity,” i.e. an expression conveying nothing of shame; it means voluntary and spontaneous gifts—“national support.” When albinos are born slaves, they and their mother have the right to be set free. Born free or slaves, they do not work, but enjoy great consideration and many privileges.

Passing still further into the Western Sudan we find René³ in his journey to Timbuctoo in 1830 reporting a complete albino infant of 18 to 20 months of age. He had white frizzy hair, eyelashes and eyebrows the colour of light flax; forehead, nose, cheeks and chin of light carnation red; the rest of the skin being “tint de lin clair”; the irides were of a light sky blue colour with pupil red as fire; he had very weak sight and marked photophobia; he had the general features of a Mandingue and seemed in good health. The other negroes disliked the colour and looked upon it as an illness. “They assured me that children born from a man and woman of this kind, that is to say from albino parents, were black⁴.”

De Rochebrune⁵ in 1881, speaking of the race Ouolave, says that among them white negroes (*Pounejh ba*) were not objects of repulsion or beggars, and cites “Mambaye

¹ *loc. cit.*, pp. 229—230.

² Cf. the common 18th century word *dondo* for albino.

³ See Bibl. No. 194.

⁴ A statement directly opposed to that made to Mollien from much the same district: see p. 126 above.

⁵ See Bibl. No. 370.

Sambayan," a fine old man, head of a Musulman school, "à la pointe sud de Saint-Louis," and a healthy negress, Fatimata n'Dyaye, famed for her conquests among the blacks of the village of Guet n'Dard. There is no characterisation of either of these cases, so that it is not possible to class them. De Rochebrune discusses at some length the spotted negroes, and divides them into two classes, which possibly correspond to our congenital partial albinism and to leucoderma, although it is not fully clear that he distinguishes the latter from various diseased or parasitic conditions of the skin which may spot the negro.

The above evidence is sufficient to show that there exist considerable frequency and variety of albinism in the French Sudan.

(iii) *Portuguese Guinea*. We have only one recorded case (see our Fig. 282). It is that of Brûe, who saw a female albino at an island (? Bissio) off Bissao in 1718. This case, although there is not the least detail of description, became classic, because the woman married to a black had black children, when apparently the writers of the time expected them to be mulatto. It was discussed¹ by Labat (1728), Snelgrave (1730), Le Cat (1765), the Abbé Demanet (1767), and Durand² (1802). The fact is well recognised at the present time, although the current explanation—dominance of the black—is inadequate.

Another albino of Guinea descent³, but we do not know whether of Portuguese, English or French Guinea, is the man described by Erasmus Wilson. He was much freckled, although not born or living in the Tropics; he had light-coloured eyes and light red woolly hair.

Lastly, we may mention the famous white negress Geneviève, described by Buffon and Dicuquemare, a full account of whom will be found in our Fig. 278. The case is an important one, because instability of pigmentation appeared in other members of the stock.

(iv) *British Guinea*. Probably the best account of albinism from the Sierra Leone district is still that of Dr Thomas Winterbottom made in 1803⁴. He recognised the several grades of albinism, and wrote most temperately about it. Thus his Waukapong young man (see our Fig. 274) was an example of our Class (iii), the youth from the Kroo Coast (see our Fig. 356), a complete albino, and the white negress of Damboya (see our Fig. 357), a combination of Classes (ii) and (iii). He also cites the case of an albino girl born of mulatto parents (see our Fig. 502). He further mentions two white negroes in the Mandingo country with white hair, light blue irides and photophobia. He writes of albinism generally: "The natives consider this as a great deformity, and look upon it as a misfortune to their family⁵. None of these people appear to labour under any imbecility of intellect." He reports a case which he considers a stage towards albinism; there is little doubt that the man he

¹ See Bibl. Nos. 50, 52, 67 and 71.

² *Voyage au Sénégal*, Paris, 1802, T. I. p. 122.

³ See our Fig. 267 and Bibl. No. 306.

⁴ See Bibl. No. 136.

⁵ This is the view of the African negro Olaudah Equiano, who, writing in 1789 of albinos, says that "they were universally regarded by myself and the natives in general, as far as related to their complexions, as deformed" (see Bibl. No. 110, 1st ed. p. 21).

examined was a xanthous negro: "A man of mulatto complexion and much freckled, though born of black parents, who had strong red hair disposed in very small wiry curls over his whole head¹." He refers to true mulattos with red or copper-coloured skins and red hair, similar to the mulatto referred to by Blumenbach², and those mentioned by von Gröben³ as occurring at Sierra Leone⁴. In this matter Margrave's Brazilian negress has been occasionally quoted, but, we think, his account should really lead us to the conclusion that she was a true xanthous negro case⁵. Winterbottom writes of his own mulatto from the Kroo Coast⁶ that his hair was pale red, such as occurs in England, and disposed in small curls over his head; his skin was very much freckled, his eyes were black and not affected by the glare of sunlight. There seems little doubt that a rufous mulatto can arise, who is closely like the xanthous type of negro.

Winterbottom sagely criticises Sprengel, Dalin, Tröxler, and other writers who have written extravagantly of albinism, and whose papers are dealt with elsewhere in this monograph.

Maas, in 1892⁷, reported a white negro from Sierra Leone who gave himself out for an "English Gentleman." He had yellow blond woolly hair, blue eyes and some nystagmus. The other negroes in the *Panopticum* at Berlin would have nothing to do with him, stating that he was a "cannibal." The same writer described⁸ the "three striped graces," a case of hereditary partial albinism (see our Fig. 509) as coming from Sierra Leone, but this, at any rate as an immediate origin, is doubtful.

Albinism, Sir Harry H. Johnston tells us⁹, occurs in Liberia, and we have already noted (see p. 114) its appearance on the Ivory Coast.

John Atkins¹⁰, surgeon in the Royal Navy, in 1725 writes of Sesthos, "a place where most of our windward slave ships stop to buy rice," that they saw at one of the towns still further up the river, "a bright yellow-coloured man, and being curious to know his original, were informed (if we interpret their signs and language right) that he came from a good distance in the country, where were more. Captain Bullfinch,

¹ *loc. cit.* p. 170.

² See Bibl. No. 125.

³ See *Guineische Reise-Beschreibung*, 1694.

⁴ See also Schreber, Bibl. No. 79, S. 15.

⁵ Margrave writes: "Vidi hic africanam foeminam, non nigram, sed ruffa plane cute & pilis ac capillis ruffis. Ex qua regione esset, non potui intelligere, nam linguam ejus non intelligebant reliqui nigrítiae." See Bibl. No. 24, p. 268. Winterbottom mentions also a family in Free Town, apparently not mulattos, in which the children had red or copper-colour skins and dirty red or singed colour hair. We may note also that Olaudah Equiano, writing in 1789, speaks of having seen when in Africa "three negro children who were tawny" (see Bibl. No. 110, p. 21). These were probably also xanthous cases. See also Lander's case (see our p. 135).

⁶ Dr E. Zintgraff, in 1895, presented photographs of two Kroo negro albinos to the Berlin Anthropological Society (*Zeitschrift für Ethnologie*, Bd. 27, S. 323): a letter sent by one of our number requesting information as to the albino photographs in possession of this Society failed to elicit any answer.

⁷ See Bibl. No. 437.

⁸ See Bibl. No. 462.

⁹ Letter dated Sept. 27, 1908. In his *Liberia*, London, 1906, we have found no reference to albinism.

¹⁰ *A Voyage to Guinea, Brazil and the West Indies*, London, 1735, p. 67. See also Astley's *New General Collection of Voyages*, Vol. II. p. 449, London, 1745.

Lamb, and others have since told me they had seen several; Mr Thompson, that he saw one at Angola, and another at Madagascar; a great Rarity, and as perplexing to account for as the black colour."

As Atkins' chapter on Sesthos follows that on the Guinea Coast, the district is probably that marked R. Cestos in Liberia of modern maps. The account is too indefinite for us to say whether the individuals referred to were xanthous or albinotic.

(v) *Gold Coast and Ashantee.* Our earliest notice of collective albinism in Ashantee occurs in Bowdich's *Mission to Ashantee* in 1819. He writes¹: "The King appeared to have nearly a hundred negroes of different colours through the shades of red and pink to white; they were collected for state, but were generally disgusting objects, diseased and emaciated; they always seemed as if going to shed their skins, and their eyes blinked in the light as if it was not their element."

Some 50 years earlier (1766) Dr James Parsons wrote an account of an albino boy brought before the Royal Society. The boy's father and mother had been brought down from 300 miles inland to the Gold Coast and shipped to Virginia, where they became the property of Colonel Benjamin Chambers. The parents were both perfectly black and very young, the mother was about 16 and the father 22 when the child was born, six or seven weeks after they landed. They had never seen a white man until they came to the coast, where Europeans were buying slaves. The mother had two children afterwards as black as their parents. No detailed description of this boy is given.

In the same paper Parsons refers to another case or two of negro albinism, *e.g.* our Fig. 287, where a white negro girl was born to black Virginian slaves, and a white negro girl exhibited some years before in London. These possibly were drawn as so many slaves from the Gold Coast.

Lastly, we may refer to a recently reported instance of albinism from Akra (? Accra on the Gold Coast). Träger (1902)² gives details of this negress, Amanua, aged about 20 (see our Fig. 508). She had a pale white skin with the black-brown spots (our Class (iii)) on shoulders, arms and breast, about the size of cherries; there were none on legs or feet; short curly hair of yellowish white colour, eyes clear blue and sensitive to strong light. The account of the eyes is very defective, but a paragraph, which has gone the round of the popular science journals³, appears to refer to the same negress. She is, therein, said to come from Acora (? Accra), near Elmina, on the Gold Coast, and her eyes to have the pinkish colour common to albinos: "part of the body still retains the colour common to the dark races, so much so that she may really be described as a piebald. Her hair is entirely white and the skin ivory-hued to an extreme." If this account were correct, we should have a piebald with albinotic eyes—a hitherto unobserved type of albinism in man⁴, although it occurs in the mouse. But we suspect that the piebaldness is only the spotting noticed by Träger, and that possibly the red reflex is the only addition the paragraph

¹ See Bibl. No. 168.

² See Bibl. No. 492.

³ *New York Sunday World*, July 26, 1908. *Popular Science Siftings*, August 22, 1908, p. 324.

⁴ Cf. our p. 125.

makes to Träger's account. If the eyes of Amanua showed the red pupil it would prove that the skin spotting of Class (iii) is not incompatible with fairly complete albinism of the eye.

(vi) *Dahomey*. Like Ashantee and Loango, the Court of Dahomey has long had its associations with albinism. Captain William Snelgrave¹, in a visit in 1730 to the King of Dahomey's camp, met with a mulatto Portuguese gentleman, who had been taken prisoner in the Ardrah war and was still a prisoner. The King had endeavoured to attach this man to himself by conferring benefits on him, and had given him an albino negress as wife. This woman was as white, says Snelgrave, as an English woman, and much whiter than her husband, but not of so lively a colour. She had the same woolly hair and features as the blacks. Her husband said she was born in a far inland country of black parents, and had never seen a white man, nor had she before she saw the King of Dahomey's prisoner, Mr Lambe, who had been captured with the Portuguese.

Much later, Commander Forbes², visiting the Court of King Gézo of Dahomey, writes: "On the neutral ground where we stood facing the pavilion roamed an ostrich, an emu, several dwarfs, hunchbacks and albinos, besides troops of dogs of almost every country and variety."

Skertchley³, in his book on *Dahomey as it is*, of 1874, says: "In Whydah there are several instances of albinism, their leprous-looking skins, yellow hair and pink eyes, combined with their negro features, rendering them anything but comely objects to an European. Among the natives they are supposed to be under the special protection of the Divinity, just as idiots are among the North American Indians."

Berchon⁴ (followed by Hovelacque⁵) says that at Gaboon and Whydah, rarely at Senegal, one finds a fairly large number of negro albinos. Their hair is fawn-red or sulphur-yellow, often dry and breakable, but sometimes relatively beautiful and of notable length. Girard saw two young girls whose hair was about 25 cm. long. Huard saw hereditary albinism in two cases at Whiddah. Generally the skin of these individuals is sprinkled with white [black?] spots, which produce a strange effect on the black [white?] of the rest of the skin, sometimes it is wholly white. The intelligence of these albinos does not appear in general lower than that of the other blacks in this country, who are far from being badly supplied in this respect. Girard knew of an albino minister to a chief of the Boulons in Gaboon.

Lastly, as early as 1785 Isert⁶ saw at Fida (? Whydah) a white negress whom the King of Dahomey had sent to the governor, saying that he too was in a position to provide him with a white woman. She was remarkably ugly, four feet in stature, with the appearance of a monstrosity. He also saw a partial albino, a negro with

¹ See Bibl. No. 52. Snelgrave and Walckenaer. Also Astley, *A New General Collection of Voyages*, Vol. II. p. 494, London, 1745.

² See James Greenwood, *Curiosities of Savage Life*, London, 1865, Vol. II. p. 6.

³ See Bibl. No. 331.

⁴ See Bibl. No. 275.

⁵ See Bibl. No. 423.

⁶ See Bibl. No. 98.

hands and feet wholly white; this occurs sometimes, he says, as the result of a severe illness; in this case the man was born thus (cf. our chapter on Partial Albinism).

We are fortunately able to give a full account of a Dahomey negro albino provided by Mr N. Bishop Harman. This account is of great value, for we have here, for the first time we believe, an ophthalmoscopic examination of a negro albino's eyes recorded, and this throws the earliest ray of light on our difficulties with regard to the negro albino eye. The man was a patient seen at the West London Hospital (Oct. 13, 1909), and was a full-blooded negro, one of the members of the Dahomey Village, an exhibit at the International Imperial Exhibition (White City), London. He was well grown, and a typical specimen of a negro so far as his form was concerned, but in colour he was as fair as the fairest of northern whites. His knowledge of English was small, and he had no interpreter; but his answers to inquiries on the colour of his family were quite definite. His father and mother were quite black, so also were his brothers and sisters. Information further than this could not be obtained. The man appeared to be about 20 years of age. His condition was excellent. In physical features, he had a broad face, high cheekbones, *bombé* forehead, broad squat nose, wide nostrils splayed out on to the cheeks, large prognathous jaws, large mouth with thick lips, fine teeth. The skin of the whole body was quite white; there was no mottling; the skin over the nose and the cheekbones was slightly scorched and reddish. On the bridge of the nose were three or four yellowish spots 1 to 2 mm. in diameter, they were probably freckles. The skin of his hands was white; the nails were pink. The hair of his head formed a thick mat of fine corkscrew spirals closely interwoven. The mat was of uniform thickness, about 4 cm.; when pulled out the hair stretched to some 10 cm., and on release sprang back into place again. The spirals of the hair had a radius of 2 mm. The colour of the hair was of the palest straw. Under a corneal loupe it looked like fine transparent catgut; the cut ends also were opaque, just like the ends of catgut. In section the hair was flat, about 0.15×0.05 mm. The hair of the brows and lids was as white as that of a white pig.

EYES. The man walked with the palpebral fissures nearly closed, and manifested intolerance of light. When the lids were held open constant lateral nystagmus was found. The globes were deeply sunken in the head. The corneae were full sized. The irides had a smooth yellowish tint; the tissue was smooth or obscure like to the condition seen in a new-born child. No red reflex could be seen through the iris tissue. The pupils had a diameter of 3 mm.; they reacted to light. Under the influence of homatropine they dilated widely. They were black in daylight, but glowed of a rather dark red when the lids were held somewhat apart and light thrown upon the sclerotic by means of a convex lens; it was, however, impossible to get a strong pencil of light upon his sclerotic owing partly to the spasm of eyelids, partly to the eyes being so overhung by the brows. The media of the eyes were normal. Refraction of each eye, as ascertained by retinoscopy, showed 14 dioptries of myopia horizontal, 17 dioptries vertical. As regards his vision, he was unable to read, and little more could be ascertained than his power to avoid obstruction in walking,

and the recognition of common objects held close to his face. High concave lenses held before his eyes elicited signs of pleasure as though he liked them.

FUNDUS (seen by incandescent electric glow lamp of the type used constantly in the hospital ward). The ground colour was a pale buff tint, and Mr Harman says he has seen nothing like it before; no distinction could be made out between the colour of the disc and that of the choroid. The vessels of the choroid were strikingly evident. They were much more easily traced than were the retinal vessels.

Unfortunately the man sailed for Africa two days after his interview with Mr Harman, who, however, was able to procure a specimen of his hair.

An excellent copy of a photograph was given in *La Nature*, 37^e Année, p. 384, Paris, 1909, with a brief note by V. Forbin, which adds nothing to Mr Harman's account, except the statement that the declaration that this negro was of pure African race and has no white ancestors, is "naïve autant qu'inutile." M. Forbin continues: "Le mélange des sangs n'a rien à voir avec l'albinisme. Au contraire, cette affection ne se rencontre jamais parmi les mulâtres et les métis. Elle n'a jamais été signalée aux Antilles, partout où les descendants d'esclaves ont perdu par des croisements la pureté de leur race." Our investigations show a considerable number of albinos born of mulattos and half-breds¹ (see our Figs. 502 and 622-4), and we have even records of albinos from the Antilles (see our pp. 156-7). There is no doubt whatever that albinos can arise without any intermixture of white and black blood. It would at present, however, be dogmatic to assert, or deny, that albinism is more frequent among half-castes or mixed races. We regret that we have not been able to procure a photograph of this Dahomey complete albino for reproduction.

(vii) *Nigeria*. Dr Henry Strachan² reports albinism in Nigeria, and while promising later individual details, gives the following facts, which he feels justified in recording from personal knowledge or reliable statements as to albinos there:—

(1) The sight is weak (from photophobia in varying degree?). Certainly they cannot easily tolerate the strong light of the sun in West Africa. Refraction so far not examined in any case.

(2) Nystagmus not yet noticed. If uncommon or slight it might well, Dr Strachan writes, have escaped the amount of attention he has been able so far to give to the subject.

(3) Albinos beget normally pigmented children by normal negro consorts. No knowledge of the result of pairing with an albino.

(4) One interesting case heard of, where an almost albino woman, in whose family were several albinos, had a pure albino child by a normal black husband.

(5) The hair, which is of course woolly, is often red.

(6) Freckles are common on the exposed skin of albinos.

It will be seen that these statements are in accordance with what we know of albinism in the negro, and serve to indicate that it occurs in Nigeria with its usual variations.

¹ There is at present an albino child, offspring of a negress and a European, in Rurrenabaque, 20 days from La Paz in Bolivia.

² Letter to E. Nettleship dated August 11, 1908.

Dr J. Pollard¹ reports having met with four albinos in Nigeria (1908), and we have received a fairly full account with specimen of hair (*ova pediculi* attached) of one of these.

The description runs : Girl aged about 17 (? Hausa²). Iris light brown; hair of head light ginger colour, of axilla straw-yellow, of arm very pale yellow, white by direct vision; skin of exposed parts slightly reddened from sunburn, with numerous flat, black-brown patches on neck, chest, arms and legs (trunk not examined); these patches are rudely circular, but with indented border and about the diameter of a three-penny piece, the hairs growing on them are rather darker than the other body hairs; skin of palms coarse and thick. Continual horizontal nystagmus; too frightened to allow ophthalmoscopic examination. She is her mother's firstborn, and all the younger ones (? number) are normal. The mother knows of no other albinos in ascendants, but "the history is of course quite unreliable."

Richard and John Lander³, writing in 1832 of their expedition to the Niger, report meeting with an apparently xanthous negress: "We omitted to mention in yesterday's journal that to our infinite astonishment we saw a middle-aged woman sitting on the roadside, the colour of whose skin was naturally as bright a red as a piece of our own scarlet cloth. We were informed that she was in good health; but we were in too great a hurry to ask her any questions or take a nearer view of her person; indeed our guide seemed much disinclined to go within a hundred yards of her. She was a most singular looking being."

Captain Landolphe⁴, in 1823, gives an account of a curious albino, whom he met with near Benin: "Among the negroes, which the phidior of Bobby had given me, there was one somewhat like an albino. Born in this village he was black, but his skin was sprinkled with spots of all colours about the size of a lentil. His hair, eyebrows and eyelashes were fair. He had round eyes; he saw objects perfectly at night without being able to distinguish them by day. I employed him in paddling, his strength being double that of his comrades." But for the account of the sight, we might suppose this to be a case of leucoderma, comparable with Sir Richard Burton's (see Plate B), but less advanced. In the spotted albino we generally find a *white* ground with black spots, but this *black* ground with coloured spots appears unusual in the extreme. With the British occupation of the Hinterland of Nigeria we may hope for more detailed accounts of albinism therein⁵.

Fernando Po. P. Gussfeldt (*Die Loango Expedition*, 1873-6, Abtheilung I. S. 27, Leipzig, 1879) saw a naked albino boy playing among the black washerwomen at Fernando Po. His dirty yellow-white colour and hair of like appearance, together with weak and screwed up eyes, gave him the appearance of a leper.

¹ Through Mr E. Treacher Collins, August 31, 1908.

² Through Dr M. C. Corner we learn that albinos are frequent among the Hausa tribes of the West African coast. His informant reports that they are cruelly treated and often killed.

³ See Bibl. No. 198—a good illustration of the traveller in too much of a hurry to travel profitably.

⁴ See Bibl. No. 174.

⁵ It is reported by Lagleyze (see Bibl. No. 552, p. 11) without statement of authority that on the island of Parrot, at the mouth of the Calabar river, an albino infant used to be sacrificed to the god of the white men, if no European merchant ship had made a visit for some time.

(viii) Of the *Kameruns*, as later of *German West Africa*, we have few data¹. Probably a study of recent German works on these districts might bring cases to light. F. Hultcr (*Wanderungen u. Forschungen im Nord-Hinterland von Kamerun*, Braunschweig, 1902) divides the country into *Waldland* und *Grasland*. He writes of the former (S. 261): "Die Hautfarbe ist bei den verschiedenen Stämmen gleich wechselnd; sie spielt von Schokoladebraun bis zu einem schmutzigen Gelb (letztere Schattierung selten). Albinos habe ich mehrere gesehen; der Gesichtsausdruck war stets blöde; der ganze Mensch machte einen kretinartigen Eindruck." Speaking of the *Grasland* negroes he says they are in general darker than the *Waldland* negroes: "Albinos sind mir nie zu Gesicht gekommen; nur einmal sah ich ein Weib das hart an der Grenze zu einem solchen stand" (S. 330). There is no detailed description, and we cannot say which types of albinos Hultcr really met with, or whether his scarce "dirty yellow" negroes were really xanthous. Lessner, writing of the Rumbi Mountains and their inhabitants (*Globus*, Bd. 86, S. 277, Braunschweig, 1904), says that the Bakundu, Baluë, Ngolo and Batanga are Bantus, and are not distinguishable in skin-colour from other natives of the "Urwaldzone." Here, as elsewhere, one finds individuals lighter, darker and more reddish. "Mehrfach habe ich auch Albinos getroffen; irgend welche besondere Rolle spielen diese nicht im Volke, man schien diese zufällige Abnormität eben nur als solche zu betrachten." Lessner gives a picture which is quite good of an "Albinoweib und Ngoloweib mit Ziernarben am Leibe" (S. 276). Curt Morgen (*Durch Kamerun von Süd nach Nord*, Leipzig, 1893), a soldier who writes without much scientific insight, saw in Ngilla's village—situated between the Sennago and Mbam rivers in the heart of Kamerun—and now named Kaiser-Wilhelmsburg several albinos (S. 212). He also refers to the light complexions of the ruling Fullah chief's family at Jibati (S. 283), their yellow skin, large almond-shaped eyes and fair smooth hair, only curled at the end. S. Passarge (*Adamaua*, Berlin, 1895, S. 426) seems to have seen only dark Fullahs, and considers that Morgen's *Blondköpfe* may have been albinos, but other authors (see our p. 127, footnote) speak of relatively fair Fullahs.

(ix) *The French Congo*. Here in Loango we have a classic centre of albinism. The Gaboon also has provided interesting cases.

The earliest account we have been able to discover is Battel's (1589—1607); it is reported in Purchas²: "There are sometimes born in this country (but very rarely says our author) of negro parents white children as fair as Europeans. These are presented always to the King, and are called Dondos. They are educated in sorcery, being the King's wizards, who always attend him. Nobody dare offend or affront them, and, if they go to market, they may take what they will, for all stand in awe of them. The King of Loango has four of them³."

¹ Gröben in 1694 (*Guineische Reise-Beschreibung*, S. 96) writes of a place, "150 meilen" inland from the Cameroon coast, as having a people with frizzy white hair and white eyebrows, blinking and light-shy by day, who fight desperately with the negroes by night: see our p. 25.

² See Bibl. No. 20. *Purchas, His Pilgrims*, p. 980.

³ Bastian says that at Quisimbo on the Congo albinos are looked upon as fetiches and allowed to steal; those stolen from feel honoured.

Within less than 100 years Vossius (see our p. 13 fn.) asserts that a great part of the attendants of the King of Loango consisted of albinos!

"Dapper¹ gives a more particular account (than Battel) of these white people. He observes that at a distance they resemble Europeans, having not only grey eyes, but red or yellow hair; but when nearer viewed their colour is like that of a dead corps, and their eyes as it were fixed in their heads. Their sight is but weak and dim, turning the eye like such as squint; but at night they see strongly, especially by moonshine. Some are of opinion that these white moors are the effect of imagination working on a black woman with child on her seeing a white; in the same manner, as history reports, a white woman, by viewing the picture of a black moor, brought forth a black child. However it is asserted that these whites of either sex are incapable of coition."

De la Croix², writing in 1688, has a chapter 'At the palace of the King of Loango,' and speaks of these white negroes as sitting before carpets with skins on their heads. They assist the King in his religious services. Their hair is blond, their eyes blue, and the body so white that from a distance it might be taken to be that of English or Dutch, but on nearer approach it is found to be a corpse-like white, or like the skin of a leper. Their eyes appear tired and weak, but are brilliant in the moonlight. The negroes regard them as monsters, and do not permit them to multiply.

De la Croix is, however, only a copy of John Ogilby³, who in his *Africa* of 1670 writes of the kingdom of Lovango. "There sit also certain white men by the King with skins on their heads, and indeed at a distance seem like our Europeans, etc."—the rest being like Dapper cited above. Ogilby gives the tale from Voss about the Portuguese taking white negroes to work in Brazil, but finding them of no service. He then adds apparently on his own responsibility:

"The King useth them in his religious ceremonies, as in making Mokisies, from whence themselves have generally that name among the inhabitants, which in our language properly signifies Field-devils⁴." This passage is copied by De la Croix. It is very difficult to determine how much original observation there really is in the accounts given by Battel, Dapper, Vossius, Ogilby and De la Croix⁵.

An independent witness to albinism in the Congo is Jerome Merolla of Sorrento⁶, a Capuchin missionary who visited the "Kongo" in 1682. He saw at Songo some strange births including twins, one black and one white⁷, and a white child brought forth by a black woman.

Leighton Wilson⁸, in 1856, refers to albinos in the kingdom of Loango, which he speaks of as Southern Guinea. He states that all dwarfs and albinos born are regarded as royal property. That whereas dwarfs are not very common, albinos may

¹ See Bibl. No. 20.

² See Bibl. No. 41.

³ See Bibl. No. 31, p. 508.

⁴ d'Houdelet says that the negroes give the devil a white skin.

⁵ See also Le Cat, Bibl. No. 67, p. 101.

⁶ See Bibl. No. 36, p. 182.

⁷ For other cases of this see our Figs. 281, 285^b and 291.

⁸ See Bibl. No. 258.

be found in almost every community in Southern Guinea. "Everywhere they are regarded as somewhat sacred, and their persons are considered inviolable. On no condition whatever would a man strike one of them. Generally they are very mild; and I have never heard of their taking advantage of their acknowledged inviolability." Wilson describes their skin as nearly a pure white, very tender, and blistering in the sun, hair cream colour, eyes grey, and always in motion, sight very imperfect in daylight. He had probably complete albinos in mind, and the chief interest in his account lies in its confirmation of the sacro-sanct character of the albino in Loango, a character which appears to extend right across modern French Africa (see Raffanel's statement as to Bakel, p. 127 above).

Further north than Loango, from the Gaboon, we have several fairly recently reported cases of albinism, the best of which are those of Louis Vincent¹ described in our Fig. 275. According to Dr Vincent the albinos (2 ♂'s, 2 ♀'s) would have been killed but for missionary intervention, as they are regarded as unlucky. Hitherto we have seen the albino as something sacred (except in the cases of the Hausa tribes recorded in our ftn. p. 135), but as we go further south this view appears to change. In the case of these albinos the hair was sulphur-yellow, the eyelashes and eyebrows slight, but of the same colour, the skin rose colour, but rough and squamous, approaching ichthyosis. The eyes had little or no pigment, irides blue with rose tinge, pupils ruby red, rotatory nystagmus and photophobia. In fact, Vincent's negro albinos were excellent illustrations of complete albinism in the negro; there is no reference to spots or to freckles. Vincent had seen partial albinos among the Gaboonese, Pahonins, Boulons and Kroomens,—only a part of the skin being without pigment. He considered these to be true pied negroes.

Among the Apingis, De Compiègne² reports in 1875 the meeting with an albino, whom he describes merely as "complètement blanc et d'une laideur repoussante." This white negro claimed to belong to the same race as the white travellers and wished to embrace them. He addressed them as follows: "Je suis blanc: où sont mes vêtements? où est mon tabac? où est mon rhum? où sont mes fusils? Veuillez me donner de suite tout cela, afin que je ne diffère plus en rien de vous." The travellers received with some coolness "ce collègue en blancheur," and were content to give him some leaves of tobacco. He left them heartbroken³.

Blanchard (*La Nature*, 1909, 38^e Année, p. 3) refers to an albino negro, aged about 40, seen 12 to 15 years earlier at the Lyons Exhibition; skin uniformly white, without spots, sulphur-yellow hair, no account of eyes; parents and offspring black.

E. Pechuël-Loesche (*Die Loango Expedition*, Abtheilung III. S. 15—16, Stuttgart, 1907) gives instances of local changes in pigmentation; in some developing young girls, they appear to come and go; and in the case of one boy patches were reported to have come and then sensibly decreased in size; the other cases of spotted negroes he reports may well have been leucoderma of the usual progressive or

¹ See Bibl. No. 326. Pictures of Dr Vincent's negro albinos are preserved in the Laboratory of Anthropology at the Paris Museum (see Bibl. No. 415).

² See Bibl. No. 585.

³ The tale at any rate is *ben trovato*, but it hardly accords with the essential shyness of most albinos.

stationary types¹. He saw only one albino, a girl, and saw her only from a distance while she was bathing; she was as light as a European.

(x) *Congo Free State*. We have already (p. 114) referred to Dybowski's meeting with incompletely albinotic or xanthous Akoas on the Congo. Alexander Boyd, in his journey *From the Niger to the Nile* (Vol. II. pp. 241-2), found the chief of the Leti village of Molegbwe in the Belgian Congo "accompanied by his white wife who was the fairest woman I ever met...She was quite naked...She was the most perfect example of an albino I have ever seen in Africa, and had quite pink eyes. Her proportions were rather too heavy to be graceful. We came across several cases of albinism in this part of the Congo, invariably women."

Ludwig Wolff² (1886) has given a long description of the Baluba, a people about 6° S. of the Equator, and between 20° and 25° long. E. in Belgian Congo. He writes: "The skin tints were judged by the Colour Table of the Paris Anthropological Society. The Baluba exhibited all shades, from deep Black 48 to Chocolate 30. The lighter colourings were more frequently met with in the Eastern tribes, where also was the greater number of albinos, whose skin-colour corresponded on the average to 23 of the Paris Table. I found the hair of the albinos usually short, frizzy and blond. The iris was brown. Nystagmus was always, if in different degrees, present. The albinos were nowhere treated badly, as if they were evil spirits or magicians, but only considered as curiosities, and by some tribes held of small account. That the Baluba contemptuously call them *tohka-tohka*—pallid folk—did not hinder their chief Kalamba Mukenge from having an albinotic spouse among his many wives; her one year old child I found already normally dark in pigmentation. Two clans on the Sankuru and Lubi led to me, directly on my arrival, an albinotic child, and a fully grown albino girl respectively. I often found partial albinism among the Bakuba and the Bakete."

This extract is of interest as showing that albinos are most frequent among the lighter shades of negro—possibly where the Bantu meets the Sudan negro—and proving that the brown iris is sometimes accompanied by nystagmus.

Right in the north-east corner of the Belgian Congo, almost on the Egyptian Sudan, we find the district where Schweinfurth has notified the presence of albinism among the Monbuttos. We are again among a lighter people, and probably on the border of two races, the Berbers and Sudan negroes. The important passages from Schweinfurth have already been quoted: see our pp. 14—15.

(xi) *Portuguese Congo. Angola*. The earliest notice we have come across of white negroes from Angola occurs in a London medical journal³ of 1827: "There were two young men, cousins, a few years ago, in Lisbon, whom we hired as servants, more from curiosity than any other motive, and it was not long before we had to dismiss both for utter uselessness. They had all the laziness of the negro race,

¹ Felkin (*Proc. R. S. Edin.* Vol. XIII. p. 706, Edinburgh, 1886) says the natives attribute these patches to *Kabalongo*, syphilis, and say that Europeans must be in a shocking state because they are so white.

² See Bibl. No. 406, p. 732.

³ See Bibl. No. 184 and our Fig. 511.

together with the woolly (though sandy-coloured) hair, flat noses, thick lips, long arms, high calves, etc. of the African; but their complexions were such as we see among the natives of the Northern countries of Europe. One was considerably flecked and the other deeply marked with smallpox. These lads were natives of Angola, and descended from black parents." Unfortunately the writer gives no account of the eyes; what he says of skin and hair is very inadequate.

Wissmann¹, in an account (1883) of his African journey, writes: "Ich will noch erwähnen, dass es mir aufgefallen ist, dass ich in Westafrika viel Albinos, in Centralafrika wenig und in Ostafrika nicht einen einzigen gefunden habe. In Westafrika habe ich ausserordentlich viel Albinos, namentlich in der Kolonie Angola, getroffen."

We regret not to have found any detailed account of these albinos. In view of the many cases reported by Drs Stannus and Turner from East Africa, we doubt whether the paucity of albinos in Central and East Africa noted by Wissmann corresponds to any real difference. West Africa has been longer under white influence, and there are districts in Africa where till quite recently the albino children were exposed or killed.

Falkenstein², in 1877, refers to an albino he saw at St Paulo de Loanda. The case is interesting because he emphasises the points: first, that the hair was not white but *weiss-blond*; and secondly, that the skin was not porcelain but rose colour. The skin, however, appears to have presented the usual albino characters: it was "leicht hypertrophirt und von fellartiger Beschaffenheit." Unfortunately there is not a word as to the age or eyes of the individual, except that he suffered from convergent strabismus³.

The Rev. W. H. Bentley⁴, in his book on pioneering in the Congo (1900), gives an account of two albinos he met with at Lemvo: "As we entered the town I was told that there were two albino girls there, and as they were just like white girls in appearance they would make good wives for missionaries. I was very curious to see these curious freaks of nature, but after the shocking idea propounded I could not pay any attention to them at all. They were sitting beside a house as we entered, but after that I did not see any more of them. Since then several albinos have been met. An albino African has a skin like an Englishman, with a tendency to pink; the frizzy hair is white or slightly yellow, and the eyes are pink and more or less intolerant of light. They often suffer from some skin disease. The African features, hair and dress, seem strangely out of place with a white skin."

We owe, however, the most complete account of albinism in the northern section of Portuguese Congo that we have come across to a series of letters from Dr Mercier Gamble⁵, of the British Missionary Society at Matadi. He writes from San Salvador,

¹ See Bibl. No. 385.

² See Bibl. No. 350.

³ The appearance of strabismus in a number of negro albinos might suggest that the visual conditions of albinism are likely to produce strabismus, but we cannot lay any stress on the association till we have some measure of negro strabismus in general.

⁴ See Bibl. No. 609.

⁵ Letters to K. Pearson, Oct. 16, Nov. 28, 1908 and Jan. 8, 1909.

and tells us that the albino is treated by other natives with great respect and fear. A woman who had given birth to an albino had formerly to enter the Ndembo, a secret society, the rites and orgies of which are described in Bentley's Congo Dictionary¹. From Dr Gamble we have the excellent photographs on Plate EE. In (97) we have Nenkondo, the son of a chieftainess of Majena. This family is a very interesting one, because besides two complete albinos (see Fig. 544) it contained two "Lukusu's" or partial albinos². In (98) and (99) we have photographs³ of negro parents with their baby, "a fine, fat, healthy little 'Saxon' with pink skin, fair curls and light blue eyes" (see our Fig. 554). Two further albino negresses reported from Kimpangu (see our Fig. 553) may well have been Bentley's "wives for missionaries." Dr Gamble briefly refers to two other female albinos and a male albino, besides a pair of "red" negroes, who are probably specimens of our Class (i), the xanthous negro; one of these comes from Kensende, where a former chieftainess was an albino. Dr Gamble considers that these data show that albinism is not very infrequent in the San Salvador district; the albinos are said to have light blue rather than pink eyes.

The Bantu of this district are a race much differentiated from the Sudan negro, and paleness of the face or skin is by no means rare. A study of the Congo skull, made by Dr Crewdson Benington of the Biometric Laboratory, and shortly to be published, will emphasise markedly the nature of the differences between these natives and the West Coast African negroes.

(xii) *Dominion of South Africa.* On the whole we have so little data from these colonies that we may class them altogether. The comparative rarity of references to albinism from the Cape seems to suggest a lessened frequency there. In 1892 Maas⁴ showed at the Berlin Anthropological Society a *Tigermenschen*, born in Cape Town, aged 19, with a comb of white hair, and spots of white, but as the change is said to have come on at five years, the case was probably one of leucoderma, although the flare and comb rather indicate partial albinism. (Compare our Plates A, C, D of Leucoderma with E, F, G, H and I of Partial Albinism, but see, however, Plate B for a leucoderma flare.) The parents were normal, and the skin was said to be "weicher und zarter" where white than elsewhere. Virchow compared the case with that of a young German savant who had also a white comb, but he did not emphasise the general distinction between white lock cases, which are usually congenital (see our Figs. 491 and 529), and leucoderma.

Dr Livingstone⁵, in his *Missionary Travels* (1857), writes: "It is remarkable that I never saw an albino in crossing Africa, although from accounts published by the Portuguese I was led to expect that they were held in favour as doctors by the chiefs. I saw several in the South; one at Kuruman is a full-grown woman, and a

¹ See Bibl. No. 601. Bentley, in his account of Ndembo, does not refer to albinism. The initiated he tells us (p. 881), "assume new names and of course of a complimentary import, implying fair, beautiful, light-skinned." The latter, perhaps, have relation to albino-cult.

² We owe a photograph of Nenlaza, the chieftainess, and her family, to the Rev. G. S. Bowskill.

³ Taken by the Rev. P. R. Lourie.

⁴ See Bibl. No. 438.

⁵ See Bibl. No. 267.

man having this peculiarity of skin was met with in the colony. Their bodies are always blistered on exposure to the sun, as the skin is more tender than that of blacks. The Kuruman woman lived for some time at Kolobeng, and generally had on her bosom and shoulders the remains of large blisters. She was most anxious to be made black, but nitrate of silver taken internally did not produce its usual effect¹. During the time I resided at Mabotsa, a woman came to the station with a fine boy, an albino. The father had ordered him to be thrown away, but the woman clung to her offspring for many years. He was remarkably intelligent for his age. The pupil of the eye was pink and the eye itself unsteady in its vision. The wool was yellow and the features were those common among the Bechuanas. After I left the place the woman is said to have got tired of living apart from her husband, who refused to have her while she retained the son. She took him out one day and killed him close to the village of Mabotsa, and nothing was done to her by the authorities. From having met with no albinos in Londa, I suspect they are there also put to death."

Deformed infants, Dr Livingstone says, are according to custom put to death. They are considered *tholo* and killed. Thus twins are *tholo*. The fact that albinos² are *tholo* to some of the Southern blacks may account for their rarity³.

The Rev H. A. Tudor saw an albino male Kaffir at Umtata, Transkei, some ten years ago, and thinks he also saw a female, both then fairly young.

Dr Charles Ward has provided us with three cases of male albinos from Zululand. In this instance the hair was white, the skin pink with no dark spots, and the irides greyish blue; there was lateral nystagmus. (See our Fig. 38, and the very characteristic photograph of this white Zulu Plate AA (86).)

Dr Geo. A. Turner has seen two Zulu albino children, the parents, whom he also saw, being both black. He was informed that there were many albinos among the Zulus living at certain places on the banks of the Tugula. Dr F. Wallace Mackenzie reports an albino Zulu living at a kraal near Fort Haye, just outside Newcastle, Natal. He saw him four years ago. He was about 45 years old, had white skin, white hair and pink eyes. He tried to examine him more in detail, but he was a very important man in his tribe and would not allow of it⁴.

¹ The account in *Bull. Soc. Anthropol. Paris*, see Bibl. No. 267, is quite incorrect.

² That an uncanny feeling frequently exists in the negro mind with regard to albinism may be illustrated by the statement in Diderot and D'Alembert's *Encyclopédie* (Bibl. No. 66), that some inhabitants of Africa consider the albino the product of illicit relations between the negress and a gorilla. Unfortunately no authority is given for this legend, which appears and reappears in writings on albinism. In Malaysia they were associated, as we have seen (p. 24), with the orang-outang.

³ Some light may also be thrown on this matter by a fact communicated to me by Dr Crewdson Benington. He told me that during his practice in South Africa on several occasions negroes brought him children with white patches of skin and wished to know whether this was not evidence of the unfaithfulness of their wives. These patches must have been congenital or they would not have excited suspicion. Further a credible witness tells us that when the Boers marry Kaffir women the children exhibit various degrees of blackness, and that some termed "St Helenas" are almost complete whites, but with long frizzly hair.

⁴ Letter to E. Nettleship, dated Wellington N.Z., Nov. 10, 1908. Édouard Foà (*Du Cap au Lac Nyassa*, Paris, 1897) gives (p. 12) the picture of a blond negress from Natal, and (p. 82) he notes the appearance of red skins among the black Kaffir Zulus.

Dr N. M. Macfarlane, Leribe, Basutoland, who has been for 16 years in Basutoland, supplies the following notes on albinism: "Albinism is fairly common amongst the Basutos. The albino's skin is often scaly and is spotted with freckle-like marks. In infancy the skin is quite white. Hair and eyelashes white or yellowish-white; iris greenish; pupils sometimes red; always nystagmus; photophobia. The Basutos like albinos because of their light skin¹; they sometimes dress them so as to imitate white people, e.g. an albino, age six months, was brought to the hospital dressed in this way. The albino women get married, because they are like white people. They are worth more head of cattle than a normal native woman." Dr Macfarlane says that there is considerable variation in the depth of colour of the normal Basuto skin. He has not seen blue-eyed Basutos, nor does he know of an intermarriage of two albinos. Marriages between blood-relations is not customary among the Basutos generally. We owe to Dr Macfarlane also the pedigree of an albino Basuto woman with two piebald cousins which appears as our Fig. 643.

From Basutoland we have Captain Fisher's case of the Basuto albino boy illustrated on Plate Z (80).

N. Bishop Harman tells us (see Fig. 416) that he saw in a Kaffir village near Pretoria two female albinotic Kaffir children; the hair pale yellow colour, and the iris a dirty slate colour, turning dusky red in some lights.

(xiii) *Portuguese East Africa and British South Africa*². Our knowledge of albinism in this district is due to Dr Geo. A. Turner, medical officer to the Witwatersrand Native Labour Association. We have already (see p. 114) above referred to his most valuable letters and report. The immense number of natives he has to handle gives him a great familiarity with various types of East African negroes. Two of the most typical albino negroes are the Shangaan male of our Plate BB (89) and (90) and the Myambaam of our Plate DD (95) and (96). The Shangaan, aged 23, had pale yellow wool on head and pubes; eczema of skin was well marked; there was nystagmus, but the photophobia was not so well marked as other cases seen by Dr Turner. He said none of his people were albinos, but his parents were not seen. The Myambaam, aged about 20 (No. 5210), is described in our Fig. 518. He also was yellow-haired; there is no remark as to his eyes.

Dr Turner³ also sends particulars of a Myambaam albino girl, unmarried, about 18 years of age, whom he saw in one of the kraals. "She was well nourished and fairly well developed. Her skin was rough and harsh, and hung in creases under her

¹ H. E. Mabile ("The Basutos of Basutoland," *Trans. Brit. and S. A. Assoc. A. Sci.*, Vol. III., 1905), seems to suggest that certain classes have a great frequency of albinos: "Besides these principal classes there were many others, the *ba Fakeng* (among whom are recruited several of the leading councillors, and are remarkable for the number of albinos), the *ba Khatla*, who used to be cannibals, etc." Dr George A. Turner tells us that the Basuto name for albino is *Lesofe*.

² We do not know whether "the white Moor" who came on board Vasco da Gama's ship at Mozambique was an Arab or an albino negro. See Astley's *New General Collection of Voyages*, Vol. I. p. 252, cf. p. 582, London, 1745.

³ Dr Turner's information is conveyed partly in letters to C. H. Usher and K. Pearson, partly in a report on various medical subjects to Prof. Reid of Aberdeen, who has kindly allowed us to use the albino data.

breasts and other parts of the body. It had the appearance of having lost all its elasticity. Besides this she had an eczema which was more or less general; the wool of the head was missing except for a few small patches, and she had intense photophobia and some nystagmus. I saw this girl's father; he was a pure-bred native of dark-coloured skin. Her mother was not in the kraal at the time of my visit, but the people told me she was the same colour as her husband. The father was an intelligent man, and he could give me no account of his father, his father's brothers or any of his relatives being white." This Myambaam girl is shown on our Plate AA (87) and (88).

Another case is that of a Mtyopi piccaninny of about three years of age. "He was a well-nourished active child. His skin was in the same condition as that of the girl described above, except that it was filthy dirty. His wool had, as in the case of the girl, come out except in a few patches, and he was suffering from intense photophobia. I saw this child's parents. They were pure natives of the black type. The father, an exceptionally intelligent man, could give me no history of any of his relatives being albinos." We give the photographs of this child with his mother and again with his father: see our Plate Z (81) and (82). Besides these complete albinos, Dr Turner has provided us with an interesting series of partial albinos (who will be discussed later) from the same districts. We have already described his three xanthous cases, Jappe, Magūmānē and Sanone (see our pp. 115-6).

Speaking of albinism generally, Dr Turner says that it is fairly common throughout the parts he has traversed. It is apparently frequently met with among all Bantu races. "I have seen examples of it in most of the principal tribes of British South Africa, excepting the Bushmen, Hottentots and Griquas...On the East Coast, at any rate, though an albino man seems to get on quite well with the other natives, and is not taken any special notice of, yet a man will not sell one of his daughters to him; and, on the other hand, the young men are frightened to take an albino girl."

Dr Turner considers the albino a truly repulsive object. "Besides the unnatural dull white colour of the skin, one constantly finds a considerable amount of eczema. The want of pigment in the choroid results in the colour of the blood vessels being reflected, with the result that the pupil is a peculiar pink colour, and the light not being partially absorbed by the pigment, causes photophobia and sometimes nystagmus¹. The wool of the head is of a dull yellow colour, reminding one somewhat of the effects of peroxide of hydrogen."

Mr Arthur McNeillie, who has been resident for six years in Mozambique, states (through Sir J. Crichton-Browne) that he has met with ten or a dozen "White Kaffirs" or albinos. They have, he says, not white but red hair.

(xiv) *British Central Africa*. Our information here is due to Dr Th. Strain, Sir Harry H. Johnston, Dr J. B. Davey, and, above all, to Dr H. Stannus, whose collection of albinotic data from Nyassaland is of the highest value.

¹ We have cited this passage because Dr Turner, giving no account of the pupils or irides of the individual albinos, probably means this statement as to pink pupil to apply to all the complete albinos described above.

From Barotseland we have Dr Th. Strain's¹ case of an albino "Kaffir boy" (see our Fig. 507). This boy was a typical instance of our Class (v). His irides were light bluish grey with no reflex, and the pupils black; the hair was yellowish white; the skin of a whiteness equal to that of a European with no pigmented spots, but with freckles on face and neck. This "boy" was the one albino among 4000 examined. He came from Barotseland in British Central Africa.

Dr J. B. Davey², Medical Officer, Nyassaland Administration, has seen two albinos, a boy and girl, in seven months almost continual travelling in North Nyassa district, during which time Dr Davey examined about 18,000 individuals. The proportion of one albino to 9000 normals is by no means a low frequency.

Case (i). At Kayuni's village, lake shore, N. Nyassa. Parents both of Wankonde tribe, said to be unrelated; mother had two other children by same father, both said to be normal, but not seen. Mother normal. The albino was a girl of about $3\frac{1}{2}$ years; hair curly, flaxen colour; whole body covered with fine downy flaxen hair, no freckles; pretty blue eyes, horizontal nystagmus; avoids sunlight on account of sunburning and discomfort in eyes; child well developed. (Seen 15/5/09.)

Case (ii). At Chikulamayimbi's village, Akamanga country, N. Nyassa. Father and mother both of Ahenga tribe, but not related; no other child. The father is dead, and the widow married to deceased husband's brother, by whom she has one child, seen and normal. The mother is normal. The albino is a boy about eight years old; hair curly and flaxen; body freckled and much sunburnt; greyish yellow eyes, horizontal nystagmus, avoids sunlight as much as possible; goes to a mission school, and is intelligent for a native; rather poor physique. (Seen 2/5/09³.)

Dr Davey has also seen a native with bluish grey eyes, but otherwise fairly normal, except that his skin was rather light for a native; hair quite normal; he said that his father's and mother's eyes were the usual dark hazel. We might put this case down as xanthism but for the remark as to the hair. It is possible that incomplete xanthism exists, *i.e.* xanthism of eyes and skin only, and a thorough study of its gradations would be of much interest. (Cf. our Fig. 120 and others.)

Mrs Young⁴ (Mission House, Karonga, Nyassaland) refers to quite a number of albinos at the north end of Lake Nyassa, and in particular mentions three albino girls; one of these may be the same as Dr Davey's Case (i). Another, younger, girl is described by Mrs Young, who has most kindly sent two photographs of mother and child, which were got with the greatest difficulty. She is the only albino in the family and has no albino relatives; the mother cannot give any reason for having such a child. "I sent a message for the mother to come; she lived some distance away. She came with the child, but the father would have nothing to do with me,

¹ Letter to K. Pearson, September, 1908.

² Letter to K. Pearson, dated Karonga, North Nyassa, July 2, 1909.

³ Dr Davey kindly sends photographs of the two cases, which are good considering that the plates had got mouldy owing to all his loads getting wet. He states that he had not a very good interpreter at his service, and that it is extremely difficult to get facts as to relationships from natives of district. The natives seem confused themselves about them, and have not sufficient distinctive names; their marriage customs also tend to make relationships obscure.

⁴ Letter to Dr W. Clark Souter of Sept. 5, 1909.

and screamed when I went near." The mother spoke another language, and it was difficult for Mrs Young to understand her. The child had no dark areas and was of pure native breed. She is "a perfect albino; her skin is just like that of a young pig, of a pinkish-white hue, and with the same fair longish downy hair (rather coarse) all over the body. She is just what a white child would be if exposed to the weather and the sun. Her eyes are a pale blue; eyelashes, eyebrows and hair are almost white, tinged with gold; her eyes are very weak—that is to say, she does not care to look up." There are two or three other albinos who come to church at this settlement. One old woman came to the dispensary, but she refused to be photographed. "She has a small tuft of white hair in front and about four patches, about the size of the palm of one's hand, on her chest and back; these are bright pink patches¹."

Sir Harry H. Johnston, in his work on British Central Africa (1897), writes: "Cases of albinism where the hair is yellowish white, the iris of the eye pink, and the body-skin an unwholesome looking reddish white, are not uncommon, though perhaps not quite so common as they are on the West Coast of Africa."

The same author says that the colour of the natives of B. C. Africa is usually dark chocolate, but cases of yellowish brown occur: "Occasionally there are cases of positive 'xanthism' or a state of coloration similar in a much less degree to albinism—namely, that wherein the colour of the skin and the iris of the eye is quite a light yellowish-brown. This type is very much admired by the negroes, especially in a woman; for their general tendency is to admire a lighter rather than a darker skin. The wives of chiefs were often pointed out to me for special notice as having skin and eyes of this rather disagreeable pale yellow brown. Perhaps it is the iris of the eye being of this light yellow colour like that of a lion's eye, which is so disagreeable." Except in cases of xanthism Sir H. H. Johnston states that the eye is black, brown or very dark hazel. In some individuals the sclerotic is yellow and clouded, in others clear and white, the latter condition accompanying the more refined type of feature, and the former the reverse.

It will be seen that British Central Africa is a district in which a considerable range of skin-colour exists among the natives². We now turn to Dr Hugh S. Stannus's very full report, based on a written account and a subsequent talk with one of our number. With regard to albinos among the native races of Nyassaland there appear to be two fairly distinct types with cases more or less intermediate.

(i) The first of a skin-colour varying from an almost dead white to pink with a little orange added. In these the irides were of a very light slaty blue colour (so-called "pink eyes" were never observed, *i.e.* the pupils were not red³).

¹ This piebald is distinct from the piebalds of our Fig. 632.

² This is confirmed by Dr A. Brown, who has travelled during three years some thousands of miles in Nyassaland, and North East Rhodesia including the uplands. He never saw, however, any other albinos except those at Bandawe: see our Fig. 648.

³ Dr Stannus had no opportunity of examining the fundus with the ophthalmoscope in any case, nor could he apply any exact tests of visual acuteness. It is possible that red light might have been got through iris and pupil under good examination conditions. Still the point remains that the pupils were not obviously red as in so many European cases, and in not a few negro cases, observed without special facilities.

Nystagmus, photophobia and poor vision always present; but in moderate illumination the sight is generally good, though in some in whom photophobia is very marked it is considerably diminished. Nystagmus is almost constant, is always lateral and rather slower than in many other conditions; it seems to be related to the amount of pigment in the iris and to the photophobia. While the irides are as stated above, there is, perhaps commonly, some pattern in orange or brown round the pupil, but this varies from case to case.

The colour of the hair is in this type universally of a light straw colour or dirty gold. On the whole the features are not so coarse as in the average native child, the lips are thinner and the nose less squat, but there is no suspicion of any mixture with European blood¹. A large number are hirsute, quite notably so, the whole body and limbs being covered with fair half-curved hairs. Dr Stannus lays stress on this; the normal natives have less body hair than the albinos. The point is one of extreme interest, because some discredit has been cast on the statements as to albino lanugo made by early writers².

The skin is delicate and sunburnt, dermatitis, ulcers, etc., are commonly caused, and there is reason to think that in consequence there may be some darkening of the skin in later life; scars as a rule are not deeply pigmented, though one of Dr Stannus's cases (see Ng'ombe, Fig. 427) must be noticed in this respect. In young albino children, if they have been carefully looked after, the skin is remarkable in absence of colour. Inasmuch as their natural life is restrained from infancy upwards, their intelligence in childhood, Dr Stannus considers, is inferior to that of the average child. Many undoubtedly die in infancy and in early childhood, but it is difficult to say whether there is a higher mortality among them.

(ii) The second type made by Dr Stannus appears to be identical with our xanthism. The skin-colour which is characteristic of it is pink *café au lait*, associated with irides usually of a light hazel, without nystagmus. The hair, however, in his cases is of the same light straw colour as in the first class. The skin becomes oddly indurated, shiny, cracked and wrinkled, very markedly so in old people. The tendency of these cases seems to be to grow darker gradually through life³.

The absence of the red or brown hair noted by Dr G. A. Turner in his xanthous cases is noteworthy. Unfortunately Sir Harry Johnston makes no statement as to the hair-colour in his note on xanthism. Probably this is further evidence of gradation in xanthism, and Dr Stannus himself remarks that his classes are not rigid and various combinations are met with.

The natives, Dr Stannus says, have no special word for albino. They are usually not liked, but a mother is fond of her albino child. They are not accounted for in any special way; they say they have just been sent by *Mlunga*—a word which embraces unknown powers. Probably they were and are killed from time to time at birth. In most of the native tribes of British Nyassaland neither man nor woman is

¹ Cf. Sir Harry Johnston's and Dr J. Costa's remarks (p. 123 ftn. and p. 146) on the association of refinement with lesser pigmentation.

² Cf. Fig. 265 and see our pp. 17, 117, 126, 127, 145.

³ Cf. the views expressed by Raffanel, cited on p. 128.

allowed to marry any blood relation of his or her mother, *i.e.* a maternal first cousin. But they may marry a blood relation of their father, *i.e.* paternal first cousin. On the whole there is reason to believe that cousin marriages are decidedly less frequent than in England. Even in prostitution, Dr Stannus believes the same custom holds. Divorce is very easily obtained.

Dr Stannus's cases are, when there was some family history, embodied in our Figs. 426—428 and 430—434. These cover 18 cases of albinism of which 10 were seen by Dr Stannus. Two other cases are described in the footnote below; they had no family details¹. An examination of these cases will show the great variety of negro albinism in British Central Africa.

Case (1) (Fig. 426) represents the inheritance of the xanthous type—Dr Stannus's second category, marked by the peculiar straw-coloured hair and good eyesight. Case (4) (Fig. 427), illustrated in our Plate Y (60), is a sample of the "spotted" albino, our Class (iii). Cases (6) and (7) (Fig. 428) and Case (2) (see ftn. p. 145) are samples of our Class (v), the blue-eyed negro albino, with photophobia and nystagmus, but little or no red reflex. They are figured on our Plate Z (84). Chesiwandivi Case (3) (Fig. 430) is a case of complete albinism of skin and yellow hair with a certain amount of orange pigment in the iris and belongs to our Class (iv), or is a transition between Classes (iv) and (v). Her photograph is given on Plate Y (77).

Another example of this transition condition—*i.e.* irides light grey-blue at periphery, gradually passing to light hazel at pupillary periphery, the pigment in the iris itself being orange—is the splendid albino baby of our Plate Y (79). This is our Fig. 431 and Dr Stannus's Case (5). Cases (8) and (9), our Fig. 432, are cases of incomplete albinism, the skin being yellowish brown and the hair yellowish brown, but the eyes normal hazel and sight good. Case (11) (Fig. 433) is another case of incomplete albinism, the skin being *café au lait*, but with normally pigmented spots—a "spotted" xanthous negro, the hair was light straw colour and the irides light uniform brown, the eyes being however photophobic and having slight nystagmus. Case (12) (Fig. 434) would correspond to a typical xanthous case with hair of golden brown and light brown eyes, were it not that the eyes suffer again from slight photophobia and lateral nystagmus. Case (10) (see footnote below) is an excellent illustration of a xanthous negress, the hair being, however, light straw instead of the red-brown colour.

Dr Stannus's cases are from the Bantu section of the population. It is impossible

¹ CASE (2). A boy aged $2\frac{1}{2}$, skin-colour quite white, not pink as colour in cheeks; irides bluish hazel, blue peripherally; pigment small in amount showing fibres of iris plainly, no pink about eyes. Photophobia and nystagmus very marked causing considerable distress; vision very poor. Hair on head very light straw colour, not so curly as usual. All over body and limbs a considerable amount of half-curved straw-coloured hair; this hair does not occur on the bodies of normal children, but is common on albinos.

CASE (10). An albino woman, aged about 30, of the darker type of albinism, hair present. This native of Nyassaland had skin *café au lait* colour, hair straw colour, irides light brown. The skin was hardened and cracked. No nystagmus and slight photophobia. There was no history of albinism of any degree in the family. Portrait Plate Y (78).

to study Dr Stannus's data without being impressed with the various grades of albinism to be found in the dark races. There is every variety of skin-colour, every degree of optic albinism, and the hair in the negro albino may take all degrees of pigmentation from white to dark brown.

As if to complete the generality of type of the albinism in Nyassaland, we have the extraordinarily interesting case of partial albinism reported by Dr Emslie from Chitimba, where the piebald character has been inherited through three generations. See Plate H (21). This case will be found discussed in our chapter on partial albinism.

(xv) *British East Africa and Uganda*. For German East Africa¹ we have no data, and for British East Africa only a few isolated notices. Personal inquiries have so far produced little harvest. Dr John W. Arthur², writing from Kikuyu, had seen no cases of it, and on inquiry of the officials at Nyrobi could hear of no recorded cases.

Sir Harry H. Johnston³ in his book on the Uganda Protectorate refers to two distinct types among the Pygmies bordering on Uganda, one being black like the ordinary negro, the other of reddish yellow colour with a light coloured downy hair (? the albinotic lanugo) over the body. The hair of these light pygmies is wavy not tightly curled, and they are inclined to have slight whiskers. The distinction between the black and yellow coloured pygmies seems to be the result of individual not tribal variations⁴. In a letter⁵ to one of us Sir Harry Johnston kindly refers to the illustration on p. 721 of Vol. II. of his book on Uganda of an albino child, Busoga (W. Coast of Victoria Nyanza). The absence of specific allusions to albinism in the *Uganda Protectorate* was merely due to an oversight. "Albinism and xanthism," says Sir Harry Johnston, "are relatively common in Uganda as over all negro Africa. Xanthism is, perhaps, more remarked on the West Coast. It is a phase wherein the iris becomes yellow-brown; the hair brown or yellow-brown, and the skin yellow when [normally] of black or chocolate."

In C. W. Hobley's *Eastern Uganda, An Ethnological Survey* (Anthropological Institute, Occasional Papers, No. 1, London, 1902) no information as to albinos was found. C. T. Wilson and R. W. Felkin (*Uganda and the Egyptian Sudan*, London, 1882) state (Vol. I. p. 149) that albinos are often met with in Uganda, being apparently commoner there than among any other tribe Wilson had seen. "They are looked upon as curiosities and are kept in the establishment of the king and great chiefs. Their hair is straw-coloured, their skin, which is rough and coarse, is of a pinkish-white colour and their eyes are very sensitive to light. No clue can be got

¹ K. Weule (*Wissenschaftliche Ergebnisse meiner stenographischen Forschungsreise in den Südosten Deutsch-Ostafrikas*, Berlin, 1908) notes (§ 16), the existence of copper skinned, almost Indian types among the *Wamwera*. He cites (S. 87) only one old negro albino, whose skin he was told had become white by using eland fat. Blanchard (*La Nature*, 38^e Année, 1909, p. 3) saw in a booth at a fair in Amiens a female albino, aged about 30, from German East Africa. He describes her in the same terms as the male albino from the French Congo: see our p. 138 fn.

² Letter to C. H. Usher, dated Feb. 4, 1909.

³ Bibl. No. 497, Vol. II. p. 527.

⁴ Very full discussion of the skin-colour of the Pygmies will be found in Franz Stuhlmann: *Mit Emin Pascha im Herz von Afrika*, Berlin, 1894, cap. xx. §§ 439—446.

⁵ Letter to K. Pearson, dated Sept. 27, 1908.

from the natives about the origin of these monstrosities. The assertion which has been made that they are the offspring of brothers and sisters, all, even Mtesa himself, absolutely deny. They say that the parents sometimes have one or two normal children, then an albino, and then another normal child; and they further assert that albinos have been known to intermarry and have perfectly normal children." The latter point¹, if verifiable, would be of great importance, it tallies with the statements of Lacerta (p. 18), of René (p. 125) and of our Figs. 307 and 605. Felkin gives much the same account in his "Notes on the Waganda Tribe of Central Africa" (*Proc. R. S. Edin.* Vol. XIII. pp. 699—770, p. 706, Edinburgh 1886). He adds that the albinos are irascible, treacherous and suffer from ophthalmia.

It is safe therefore to assert that albinism occurs on and north of the Equator on the East Coast. Possibly it is just as frequent as we have found it, owing to the careful observations of Drs Stannus and Turner, on the East Coast south of the Equator. Its apparent absence there—relatively to the West Coast—as asserted by several writers, rests we believe solely on a paucity of acquaintance with the natives, as compared with the familiarity gained during centuries of trade with the natives of the West Coast.

(xvi) *Somaliland*. We have no facts as to albinism in Africa, east of Abyssinia, but its occurrence among the black, non-negroid Somali would be of interest and probably present certain peculiarities. The ethnographic characters of Somali, Galla and Harari have been rather fully treated by Paulitschke². He indicates the very mixed character of the population and the great variety of skin-colours with a modern tendency to admire and accordingly to marry into the lighter shades. He does not refer to albinism, but we should anticipate a rich harvest from a consideration of skin-colour inheritance in this quarter of Africa.

(xvii) *Madagascar*. Before leaving Africa we have to note the occurrence of albinism in Madagascar, with some interesting variants. The earliest published notice of albinism in Madagascar appears to be due to the Jesuit fathers. G. Tachard published in 1687³ in an account of a voyage round the Cape some

¹ Lagleyze (Bibl. No. 552, p. 35) writes: "Je n'ai trouvé cité aucun cas d'union entre deux albinos européens. Power (Nouvelle-Bretagne), de Rochas (Nouvelle-Calédonie) et Wilson (Afrique centrale) citent des cas de mariages entre albinos, où les enfants étaient tous normaux. Mollien seul raconte avoir entendu dire qu'en Sénégambie les albinos mariés entre eux engendrent des enfants albinos." Lagleyze does not cite René, and his references are very vague. His bibliography contains no "Power," but a "Powel," who is apparently our Powell. We have cited him on p. 75, and he makes no assertion about the children of *two* albino parents. We have read and re-read de Rochas (Bibl. No. 277) without being able to discover the passage to which Lagleyze is referring. De Rochas says that albinos are not sterile, and their offspring are black and healthy (see our p. 82); he does not state that he means this to apply when *both* parents are albinos. The only Wilson in Lagleyze's bibliography is accredited with a work on *Western Africa* in 1856. This must be J. Leighton Wilson (Bibl. No. 258) and on p. 312 he says: "They [albinos] are believed, but whether correctly or not, I am not prepared to say, to be incapable of propagation." It is hardly likely therefore that he knew cases of albino × albino producing normals. It is very regrettable that writers should be cited as giving evidence on a fundamental point like this, and the reader be left without any means of verifying what they have really said.

² *Beiträge zur Ethnographie u. Anthropologie der Somäl, Galla, und Harari*, Leipzig 1886.

³ See Bibl. No. 38.

particulars as to albinos. He says that having passed the Cape and reached the 27 degree of latitude, which would bring him to the south of Madagascar, they met 10 or 12 leagues from the coast a very numerous nation, more civilised than those hitherto met with. They had long hair falling on their shoulders, and among them were some as white as Europeans, but these used to darken themselves with a mixture of grease and the powder of a black stone. "Leurs femmes sont naturellement fort blanches; mais afin de plaire à leurs maris ils se noircissent comme eux."

We have already cited Atkins' statement of 1735 that Thompson had met with a xanthous or albinotic individual in Madagascar. A rather more definite account appeared 25 years later of a definite albino in *L'Histoire de L'Académie Royale des Sciences*¹ for 1760. The report states that M. de la Nux had seen a *chacrélat* in the Isle of Madagascar, who was the son of a father and mother both black and Malagasy; the natives regarded him as a very extraordinary being and as a kind of monstrosity. M. de la Nux stated at the same time that there existed in the Isle of Bourbon (Reunion to the east of Madagascar) another *chacrélat* born among the Kaffirs. He added that the skin of the *chacrélat* he had seen was mottled with spots of a dark chestnut colour and as varied as those one calls freckles; this marking much increases their deformity. It will be clear that de la Nux had seen albinos of Class (iii), our spotted type.

Bory de St Vincent² in 1827 cites an interesting case of an albino girl seen in Mascareigne (*i.e.* the Mauritius group), but purchased in Madagascar, who had albino children, one by a white and one by a negro father (see our Fig. 415), they had the white skin and hair of their mother, but their eyes were not red but very light chestnut. They belonged accordingly to our Class (iv) and are comparable with the albinos seen by Dr Stannus on the mainland.

In 1878 a good deal of discussion³ was set going by a paper by Dr A. Corre on a case of twin Malagasy albinos, who were seen at Nossi-Bé, a small island off the north-western coast of Madagascar. The father was Sakalave and the mother Betsimitsara; see our Fig. 276. Topinard's views do not seem very clearly expressed, but Corre's cases—the like of which he himself says "ne sont très rares à Madagascar et dans les îles adjacentes"—seem to be very similar to those seen on the mainland by Dr Stannus, which we have grouped as Class (v) with a slight approach to Class (iv). They do not appear to be the typical xanthous type, because the skin was absolutely white, rosy face and neck, in every way comparable with a northern European's. The hair was pale blond, and the eyes with irides of light blue greenish colour, approaching to brown round the pupil, which was black. The sight was good; no nystagmus is recorded. There was no ophthalmoscopic examination of the eyes. Until this has been made, and until cases of such negro eyes have been dissected, it is probably impossible to measure accurately the degree of albinism of these eyes. The exact grade of the incompleteness of the albinism cannot

¹ See Bibl. No. 59 (1760, p. 17).

² See Bibl. No. 185, T. II. p. 143.

³ See Bibl. Nos. 356 and 359.

therefore be stated, and it is hardly profitable to discuss it. All we can say is that it is a type of albinism which occurs very frequently among the black races, and is of great importance for the evolution of the white races. Corre found like Stannus (see our p. 147) the body hairs very abundant and without a suspicion of European blood, the features more refined and less negroid than in the average native¹. Add to this that the individuals appear to have been physically well developed and not at all incapacitated, as so often is the case, by their albinism,—“Ces deux sujets, fort intelligents, de constitution vigoureuse, n'offrent rien qui rappelât un état pathologique quelconque,”—and we shall appreciate the possibilities of such a type for racial evolution.

With Madagascar we conclude our survey of African albinism, but before we conclude our discussion of the negro albino we have to consider whether this albinism has been carried with the negro to the Western World. As a matter of fact the attention of Europe was first drawn to albinism by the occurrence of it among the slaves transported to America. Does this albinism exhibit the same characters that we have noted when it occurs in the original home of the negro?

B. Negro Albinism outside Africa.

(i) *North America.* The slaves carried to the American plantations provide us with some of the earliest instances recorded of albinism and partial albinism in the negro. Among recent accounts, however, of the American negro we find little reference to xanthism or piebalds. Our fairly wide-spread inquiries among medical men in the West Indies and the United States, while leading to the discovery of several cases of albinism, and a few of apparent xanthism, have failed to disclose any piebald cases. The occurrence of congenital piebalds in Africa at the present day does not permit us, however, to place all the piebalds of the early days of slavery down to misinterpreted cases of leucoderma. This matter will be more fully dealt with later, but is referred to here, because the piebald or partially albinotic negro created even more excitement in the early days than the white negro or complete albino, and is constantly referred to in the early negro albino literature.

While the earliest and perhaps most interesting case of slave albino is that of Voltaire's “small white animal” brought to Europe in 1734 from Surinam, yet North America produced classical cases described by Jefferson² as early as 1787. See our Figs. 271, 283 and 284. In these cases the albinism seems to have been complete, the hair was white; the skin cadaverous white, without spots of pigment, although there were freckles in at least one case. There was photophobia and nystagmus, but no detailed account of irides or pupils is provided. The albinos were well developed except for feebleness of sight. A further case of a “pied negro” given by Jefferson appears to have been a case of leucoderma which had become stationary.

Dr Benjamin Rush³ writing on the colour of negroes (Philadelphia, 1799) might have given us some interesting facts, but he is too busy with a theory that the black

¹ Cf. our footnote, p. 147.

² See Bibl. No. 102 and for a French translation No. 111.

³ See Bibl. No. 128.

colour of the negro is due to a modification of leprosy—an inversion of the views of Sprengel and others that albinism is a form of leprosy! This leprosy according to him “sometimes appears with black and white spots all over the body, a picture of such a negro in Virginia has been preserved by Mr Peale in his museum¹.” Perhaps the only other point worth quoting is an account given by a mysterious Mr Hawkins who travelled in Central Africa, who describes people afflicted with this disease (leprosy!) as follows: “They go entirely naked; their skin is white, but has not that animated appearance so noticeable in Europeans. It has a dull death-like whitish cast, that conveys an idea of sickness more than of health. Their hair is red, or ashes-coloured, yellowish wool, and their eyes are uniformly white, in that part by which others are distinguished into black, grey and blue eyes. They are set deep in their head and very commonly squint, for as their skin is deprived of the black mucous web, the distinguishing characteristic of these Africans, so their eyes are destitute of that black matter resembling a pigment, so universally found in people of all countries and so useful in preventing the eye from being injured in cases of exposure to strong light.” Hawkins says that these white people have black parents and no apparent cause can be given for their affliction as white people are very seldom there and then the children are yellow or mulatto. Some natives put it down to women being debauched by large baboons. It is very clear that Hawkins is describing albinos and not lepers, and he knows the baboon tradition (see our p. 139, fn.). He has recognised the shades found in albino hair, and even his account of the eyes is not wholly out of keeping with the slaty-blue or grey of the albino eye and the formless character of the irides².

Dr James Parsons³ in 1765 (see our Fig. 287) gave an admirable story of a baby girl illustrating heredity in negro albinism, but unfortunately no details of another albino shown before the Royal Society are included in his paper. Two of Parsons's cases were offspring of Virginian slaves⁴. Admiral Ward's case of the albino girl was to have been shown to the Royal Society, but she caught small-pox on the way over and was sent back to America. Parsons also tells a tale of Admiral Franklin capturing a Spanish ship and bringing her to N. Carolina. Upon it was found a picture of a boy (? girl) beautifully mottled all over with black and white spots. It was said to be the portrait of a child born of negro parents on the Spanish Main; several copies were taken of the picture, and Parsons promised to inquire further: see our Chapter on Partial Albinism.

Oliver Goldsmith⁵, in his *History of the Earth* (1774), states that he had seen

¹ The dispersal of the Peale Museum allows of little hope of tracing this picture. For an account of the fate of this Museum, see *Popular Science Monthly*, Vol. LXXV. pp. 221 *et seq.* 1909.

² In the albino dog's eye in certain lights there appears no formed boundary at all between pupil, iris and sclerotica.

³ See Bibl. No. 68, and also No. 228.

⁴ Parsons's cases are (a) Colonel Benjamin Chambers' boy, sold in 1764 to Hill-Clark, shown to the Royal Society; (b) white negro girl shown in London some years before Parsons wrote; (c) albino girl born in Virginia, Admiral Ward's girl, our Fig. 287. All these cases were of albinos born to normal negro parents.

⁵ See Bibl. No. 78.

in London at different times two white negroes, and that whereas he had been told that such whiteness was due to a disease he found in the last one shown in London that the colour was exactly like that of a European, the visage white and ruddy, and the lips of proper redness. There were, however, sufficient marks to convince him of the negro descent. The hair was white and woolly; the iris was *yellow*, inclining to red; the nose was flat, the lips thick and prominent. It is quite possible that Goldsmith's negro was Hill-Clark's Virginian boy (see fn. p. 153).

Hone¹ in 1825, wandering round Bartholomew Fair in Smithfield, came across a white negro girl; her skin was the colour of a European's, her features typically negro. "Her hair, if it could be called hair, was of a dirtyish flaxen hue; it hung in ropes of a clothly texture the thickness of a quill, and from four to six inches in length." Probably science would profit by a study of the booths at fairs even to-day.

In the *Histoire de L'Academie Royale des Sciences* (1744)² is further an account of a negro boy born in America of black negro parents. He was aged 4 to 5 years, and had a white skin, white wool, white eyelashes and eyebrows; the pupil in a certain light appeared light red; there was photophobia and nystagmus.

It will be seen that these early exhibition negroes appear to have been more completely albinotic than the samples now met with in Africa. But some of the later ones are not so complete. Thus Erasmus Wilson's case of Alexander Commotius Stewart, born in New Providence, had a skin like a dead leaf, large and irregular freckles, light-coloured eyes and red woolly hair.

Of other American writers who have recorded cases of negro albinism we may note Marcy (whose case, however, is as early as 1837: see our Fig. 277), Kneeland (1860: see our Fig. 514), Joseph Jones (1869: see our Figs. 266 and 286), J. S. H. (1884: see our Fig. 285^a), and Farabee (1903: see our Fig. 279)—all of whom have given to some extent family histories. Kneeland refers to three albino negresses; the skin white, the hair slightly yellow, and iris and pupil pink—we have clearly samples of the complete negro albino, our Class (ii). Marcy's cases, two female and one male, appear to have been complete; although the eyes were light blue, the pupil was encircled with a delicate ring of pink. In J. S. H.'s and Farabee's cases there is no adequate description given of the nature of the albinism. Dr Jones' are the only cases which are adequately described, and they are well illustrated in the original memoir. II. 6 of Fig. 266 is said to have had perfectly white hair when young, now (1869) light yellowish brown; eyes clear brown with dark pupils, but nystagmus and photophobia. He is probably to be included in our Class (iv). The albino stock

¹ *The Every Day Book and Table Book*, Vol. I. London 1826, p. 1189. "The white negro, who was rescued from her Black Parents by the bravery of a British Officer—the only white negro girl alive...Six curiosities alive! Only a Penny to see them all alive!" formed the inscription on the Booth, and the showman cried: "The white negro, the greatest curiosity ever seen, the first that has been exhibited since the reign of George the Second, look at the head and hair, ladies and gentlemen, and pull it; there's no deception it's like ropes of wool."

² See Bibl. No. 59, p. 13.

described in our Fig. 286 is of special interest and importance. Some members of the stock are undoubtedly complete albinos; another is xanthous; others appear congenitally spotted, and still others with progressive leucosis (?leucoderma). This association of various albinotic conditions is not unnoted elsewhere (see our Figs. 272, 288—where the xanthous members were called in the original “mulattoes”—and Figs. 441 and 643), but it is of much value. Without Jones's cases we might be led to hold that the lesser grades of albinism hardly occurred in the transplanted negro, at any rate in North America. We believe that a close study of albinism in the American negro, with special reference to the grades of leucosis, would well repay the necessary labour. In America there has at present been little done in this field; possibly because xanthous cases have been supposed due to the mixture with European blood.

Various minor cases of negro albinism, possibly due to North American slave ancestry, will be found on our Plate XXVIII.

(ii) *South American Negroes*. Strange as it may seem, South America has produced, perhaps, more cases, and certainly more classical cases, of negro albinism than North America. Foremost among these is that reported by Fermin from Surinam, but discussed by Treytorens, Voltaire and Maupertius (see our Fig. 288). This is the case of an albinotic stock producing both albino and xanthous members, although the former attracted the more attention in 1734. The albinos appear to have been practically complete, red pupils, etc., but the hair was white “*tirant sur le roux*.”

Earlier still (1648) we have Margrave's case, cited in almost all later works touching on albinism, of the African negress in Brazil, who was not black but red, skin and hair and curls red¹. Then we have Père Gumilla's case² of the piebald negress, born in 1738, at Cartagena, and in this case also, if, as is possible, it be identical with that reported to Diderot and D'Alembert (see our Fig. 269), there were albino siblings of the pied child, indicating grades of albinism in the same stock. M. de Pauw reported from the same date, 1738 (see our Fig. 437), but not apparently the same family, four albino offspring to a negress at Cartagena; the skin was white, without any mixture of red, and the hair of a bright orange yellow. Porte provides us with five cases of negro albinos from Brazil. First two brothers, red-eyed and photophobic, with white skins spotted or freckled, practically complete albinos (see our Fig. 270); then an albino, twin with a black negro, white skin without spots, hair white “*tirant sur le roux*,” eyes of clear blue, some photophobia, but no mention of red pupils (see our Fig. 285^b); and lastly two sisters, skin spotted, red eyes, marked photophobia, hair white “*tirant vers le roux*” (see Fig. 285^c). Porte's case of twins, one negro and one albino, is exactly paralleled by a case of Fermin reported in 1769 to the Berlin Academy of Sciences (see our Fig. 291). Of the same date is the report of Castel's case of a completely albinotic boy, born to negro parents at Paramaribo (see our Fig. 270).

¹ See our footnote, p. 130.

² See our chapter on Partial Albinism.

Hille¹ (1842) recorded an interesting case from Guiana of an albino negro, between 40 and 50 years of age, capable bricklayer, average intelligence; his hair woolly and light blond, skin like that of a white European, his cheeks ruddy, which is not the case with Europeans who have been born or lived long in the district. His eyes *light brown*, with heavy woolly eyebrows, rotatory nystagmus, photophobia, and poor sight. He was derisively called "masra negre" by other negroes, but otherwise not persecuted, disliked, avoided or held in honour. He apparently belongs to our Class (iv).

Lastly, we may note Margrave's case of a complete albino negro recorded in our Fig. 512. It will be seen from these briefly cited cases that South America has produced almost as wide a range of variety in negro albinism as we have found in Africa itself.

(iii) *West Indian Islands.* Like South America these islands present us with some of the classical cases of negro albinism. In the first place we must mention the famous case of Geneviève, discussed by Buffon and Dicuquemare (see our Fig. 278). She came from Dominica, where she was born in 1759. The case is of much interest, partly because an elder brother appears to have been xanthous, partly because Buffon states that her hair was reddish at the terminals, and partly because while she had photophobia and nystagmus, neither author reports redness of the pupils or iris; the iris was grey with a slight tint of orange "towards the crystalline lens." The case appears to have been one of our Class (iv). Dicuquemare² also describes another albino negro girl, Quercana (see our Fig. 292), born of very black parents "in Africa," with much the same eyes, except that they had apparently no photophobia, were not myopic, but had some occasional nystagmus; the irides were grey, with a slight mixture of thin yellow streaks, the pupil of a much darker grey almost black; the hair with slightly more red than the wool of the sheep. This girl appears like Geneviève to have belonged to Class (iv), or at any rate to have been a transition case between that and Class (ii). Arthaud, in a rather good paper for his date (1789)³, gives several references to white negroes. Artois, in 1783, had seen a white negress born to black parents at Cap in Dominica. In Guadeloupe, Valable, in 1770, saw two twin white negresses between 18 and 20 years of age, and Gauché, at Port de Paix, another white negress. Several other albinos were seen by Deshayes in the south of the island, but their sex is not stated⁴. Arthaud also gives an account of two pied negroes: see our chapter on Partial Albinism.

¹ See Bibl. No. 232.

² See Bibl. No. 83 (T. xxxii. 1788).

³ See Bibl. No. 108. Arthaud had also an appreciation of the transmission of colour factors through the albino. "Le principe colorant, inhérent aux molécules organiques d'un albinos, est sans doute fortifié par l'adaptation énergique du principe colorant, qui n'a subi aucune altération dans les molécules organiques qui proviennent d'un individu noir" (p. 277)—this to account for the fact that negroes and albino negresses have black offspring.

⁴ Deshayes' account of these white negroes is very good: they only differ from their parents in colour, they have the same specific characters, only their constitution is not so robust; but they are not as weak and degraded as some have reported. Some are carnation colour with lips vermilion;

Carron du Villards mentions a spotted individual from Porto Rico, who exhibited himself on the boulevards in Paris in company with an albino Jewess¹. Giglioli, in 1881², brought to the notice of the Italian Anthropological Society a negro albino from St Thomas in the Antilles. Dr Boon³, in 1892, exhibited two complete albino children, born of negro parents at the Leeward Islands Branch of the British Medical Association; in this case there was albinism in the parental stock (see our Fig. 281). Lastly we may note that Masurier painted a young pied negress with delicate rose-tinted skin at Martinique in 1782, and that his two paintings of her still exist in the galleries of anthropology in the Museum of Natural History at Paris⁴.

In addition to the above published cases we have to report the result of our inquiries in the British West Indies. These were chiefly directed to ascertaining whether any pied negroes were now in existence, and will be considered in our chapter on Partial Albinism. We note first Dr W. G. Heath's interesting cases (Figs. 272 and 280) from Montserrat. In the first of these we have apparently albinism appearing in a stock also showing xanthous members, with reddish hair and grey eyes. In the second case the albino negress had large brown freckly spots on her white blistered-looking skin, and reddish white hair. Dr Heath does not describe the eyes. Dr Cleaver describes from Trinidad two albinotic children with beautifully white complexion, reddish white hair, and blue eyes with nystagmus (see our Fig. 273). From the same island Dr R. H. E. Knaggs provides a case of albinotic negro father and daughter (see our Fig. 294); the skin was dirty white and freckled, the eyes pink, the hair sandy coloured. These appear to have been complete albinos.

Finally Dr I. Costa sends two families (see our Figs. 510 and 517) from Jamaica. The photograph of one of these cases appears on Plate DD (93) and (94), and his light yellow hair had a slight reddish tinge (not reproduced). The father in this case, who had albino children by three different wives, was a "light coloured negro" without any European blood—possibly of xanthous type.

It will be seen that in broad lines the albino negro in America and the West Indies has not been differentiated by civilised environment from the albino negro of Africa. While white-haired pink-eyed negro albinos occur in both hemispheres, yet the American negro albino also exhibits the same tendency to yellow or reddish hair tones; the eyes show less frequently or less markedly the pink pupil or red reflex of the iris. That the spotting does not seem so frequent as in Africa may be largely due to absence of exposure to the sun. We have noted that this spotting does not appear to occur in the young negro albinos, nor in the clothed albinos of the Pacific (see our pp. 128, 147 and 55—6). Minor spotting or freckling is common to both hemispheres. The xanthous negro stocks have also reached America, and there their head covered with *reddish* wool; their sight is not so good and they cannot see as far as the ordinary man; the iris is diversely coloured and the globe of the eye has a peculiar vibration. They are not deaf and their intellectual faculties are as good as those of other negroes. The skin of their hands and feet is hard to the touch and in youth has the wrinkles of decrepitude.

¹ See Bibl. No. 219.

² See Bibl. No. 369.

³ See Bibl. No. 436.

⁴ See Bibl. No. 415.

appears to be the same occurrence of linked xanthism and albinism in negro families. In many respects it must be easier to study the characters of negro albinism in America and the West Indies than in Africa itself, and we very earnestly hope that some attempt will be made to describe ophthalmoscopically, and if opportunity offers microscopically, the various types of albino eye described as "grey," "blue," "light brown or yellow," and presenting little or no marked red reflex. From such eyes—often apparently having but little defect of vision—much can possibly be learnt bearing upon racial evolution. Another point which deserves special attention in future records is the correlation reported in several cases of albinotic characters with reduced negroid features (nose, lips, smell, etc.) other than pigmentation. If this were substantiated in pure blood negro cases, it would again have important bearing on racial origins.

In the whole survey we have come across accounts, more or less complete, of 213 negro albinos. It is possible that one or two individuals may have been duplicated, because it is not easy in the earlier records to be quite sure of locality or individual. Of these 108 were male, 83 female, and 22 unsexed. But little weight can be given to this sex difference, partly because the males may easily have been more in evidence, and partly because exposure of albinos admittedly occurring in Africa, it may not have borne equally on both sexes. When we come to attempt any classification we find it must be of the roughest possible character. This arises from the fact that so many of the early accounts are insufficient even from the standpoint of skin and hair; and further that many of the modern accounts do not enable us to say whether the albinism of the eyes is to be considered complete. Putting xanthous and piebalds in one class, and all albinos with definite nystagmus and photophobia in the other, while exercising some personal judgment as to doubtful cases, we find, complete albinos 79 ♂, 69 ♀, 19 ○; incomplete and partial albinos 29 ♂, 14 ♀, 3 ○. The ratio 3 : 1 of complete and incomplete is not widely different from what we have found for the white races.

NOTES TO CHAPTER III.

Norway, p. 29. A number of new albinotic pedigrees will be found on our plates (see Figs. 634—5, 637 and 650) which have been sent by Dr V. Magnus since this chapter was printed off.

Germany, p. 32. Dr Meyerhof, of Cairo, tells us that in his hospital practice in Germany he saw 10 cases of complete albinism in some 20,000 eye-patients. This may be compared with Trettenbacher's Russian Statistics (see our p. 31), 4 albinos in 46,000 eye-patients, and Lagleyze's Argentine Statistics, 27 albinos in about 30,000 eye-patients in private practice, and no case "recollected" in 26 years with 100,000 patients in hospital practice¹. Excluding the latter statement as somewhat indefinite, it would seem that one albino per 2000 to 3000 eye-patients is a rough ratio of the albinotic frequency in a selected class, that of eye-patients. Dr Meyerhof also notes that in Hanover he observed nearly 30 cases of incomplete albinism (white skin and hair, light blue irides, connected or not with anomalies of refraction); these cases belonged in the most part to the East Friesland race.

¹ See Bibl. No. 552, p. 14.

Königsberg. The marriage of an albino in 1821 caused apparently a good deal of popular interest: see the pamphlet *Ein höchst sonderbares und sehr merkwürdiges Ereigniss in Königsberg; nehmlich die den 20^{ten} März 1821 in der polnischen Kirche vollzogene Trauung eines Nachtmenschen mit einer Köchin*. A copy is preserved in the Königsberg Library.

England, p. 35. Albinism has been attributed by several writers to Edward the Confessor. Thus we note: Freeman, *Norman Conquest*, 2nd ed. vol. II. p. 27, "Eadward was seemingly an *albino*"; Stanley, *Memorials of Westminster Abbey*, p. 13, "We know the Confessor well from the descriptions preserved by his contemporaries. His appearance was such that no one could forget. It was almost that of an albino." Freeman and Stanley both wrote in 1867—8. The writer in the *Dictionary of National Biography*, vol. XVII. p. 8 (1889) says that Edward "was doubtless an albino." There is only *one* contemporary account, all other personal descriptions are derived from it, namely the *Vita Aeduardi Regis* of the Harleian MS. 526, published by Luard in the Rolls Series, 1858. It runs: "Et ut statum sive formam ejusdem non praetereamus, hominis persona erat decentissima, discretæ proceritatis, capillis et barba canitiæ insignis lactea, facie plena et cute rosea, manibus macris et niveis, longis quoque interlucentibus digitis, reliquo corpore toto integer et regius homo. Continua gravitate jocundus, humiliatis incedens visibus, gratissimæ cum quovis affabilitatis. Si ratio aliquem suscicaret animi motum, leonini videbatur terroris, iram tamen non prodebat jurgiis" (p. 396). The writer probably saw Edward after 60 years of age and when he was approaching senility. There is not a word in this description about white hair *from birth*; there is not a word about pink pupils or nystagmus or the skin in general being white. William of Malmesbury, paraphrasing this writer, says, quite without warrant, "toto corpore lacteus." Stanley bases on the phrase "humiliatis incedens visibus" a suspicion of photophobia—"his eyes were always fixed on the ground," and the "*manibus macris et niveis*" becomes, by aid of William of Malmesbury, in the *D. N. Biog.* the general statement that "his skin was white." The biographer would almost certainly have referred to the chief characteristic of the albino eyes, and it is not easy to realise an albino appearing *leonini terroris*. On the whole it appears to us that the myth has been based upon very slender foundations, and that later writers have followed Freeman, who possibly knew little of the pathology of albinism beyond whiteness of hair. The miniaturist of the Cambridge manuscript of the French Life of Edward, working perhaps 150 years after Edward's death, knows nothing of an albino tradition and makes the Confessor a blond with golden hair¹.

France, p. 38. Several French cases on our lists escaped notice in the text. Dr L. Dubar, of Armentières, in a letter (dated March 20, 1906) mentions an albino male infant of 6 months, there being no other case in the family. Rayer mentions an incompletely albinotic mother and two albino daughters, aged respectively 3 and 15 years, natives of Paris (case of Louisa de Brun; see Bibl. No. 210, p. 935). Mortillet knew in 1855 three incomplete albinos in a family living between Amecy and Alby (see Bibl. No. 424). Broc states that albinism is not rare in the Département de la Creuse, where probably no year passes without an albino being born (see Bibl. No. 215). Finally, we may note the albino girl, aged 15, with pink eyes and very scaly skin, said by Renaudin to be the offspring of a French officer and a negress in the Isle of France, *i.e.* Mauritius (see Bibl. No. 149).

Switzerland, p. 39. Since this section was written C. H. Usher has made a journey to Switzerland to collect data as to albinos. He has succeeded in bringing Cornaz's Chassot-Rey pedigree down to date—*i.e.* adding another three generations (see our Fig. 640), but without finding additional albinos. He has also obtained another long Swiss albino pedigree, the de R—— M—— pedigree (see our Fig. 641). He further heard of an albino family in the valley of Hérémence, and of another albino family in the Lötschen valley, Valais. So far, we have not procured details of the latter two stocks, but it will be seen that our Swiss material is considerably extended. There are, he heard, two albinos in an asylum for the blind in Lausanne.

¹ Green (*Short History of the English People*, Vol. I. p. 130, 1894) writes that "there was something shadowlike in the thin form, the delicate complexion, the transparent, womanly hands that contrasted with the blue eyes and golden hair of his race." Does this mean Edward had blue eyes and golden hair? If so, on what authority is it stated? If the passage contrasts Edward with other members of his race, on what authority is he denied blue eyes? Most anthropologists would expect in youth that a delicate complexion "plump and ruddy skin" would be found associated with blue eyes and blond hair. This part of the contrast appears very idle.

Swiss School Pigmentation Survey. Precisely as in the other pigmentation surveys of school children, that of Switzerland organised by Kollmann¹ gives us no satisfactory data as to albinos. The method adopted is that of Virchow's Prussian survey and there is the same obscurity (see our p. 32) as to what is meant by "Farbe der Augen." Is the apparent colour of the irides stated, and would, if this be so, an albino be stated to have "red eyes"? 405,609 children were recorded with the following results as far as albinism is concerned:

Eyes	Hair	Skin	Under 11	Over 11	Eyes	Hair	Skin	Under 11	Over 11
Blue	White	Light	13	4	Red	Blond	Brown	5	1
Brown	White	Light	2	1	Red	Blond	Light	4	3
Grey	White	Light	25	7	Red	Brown	Brown	3	2
					Red	Brown	Light	4	—
					Red	Red	Light	4	1
					Red	Red	Red	1	—
					Red	Black	Brown	2	2
					Red	Black	Light	2	1
Grand Total 52		Totals	40	12	Grand Total 35		Totals	25	10

Kollmann himself says that "red eyes" denote an absence of pigment and speaks of 35 such cases. If this were a true test, there would be 1 albino in Switzerland to 11,000 or 12,000 children. Kollmann himself states that it is an interesting observation bearing on the appearance of albinism that the want of pigment in the eye can appear as a totally local affection, while the rest of the organism has at its disposal, occasionally seen in black hair and dark skin, a fullness of pigment, which under normal conditions is to be found in every eye (p. 25). Surely this very fact ought to have caused Kollmann to pause? Incomplete albinism of skin and hair with complete albinism of the eyes occurs, but, as our own investigations show, is not as frequent as complete albinism of eyes, hair and skin. Yet not *one single case of complete albinism* was brought to light by this Swiss survey of 405,609 children! In no single case were light skin, white hair and red eyes combined! Under what category have the 18 to 20 *complete* albinos we should expect in this population been entered? We are not at all certain that they may not be really contained under the headings "blue eyes, white hair, light skin," and "red eyes, blond hair and light skin." Anyhow we consider it unreasonable to class 35 children as albinos, not one of whom has white hair, 15 of whom have brown skins, and 16 brown or black hair. On the other hand, of 52 children having white hair and light skin, not a single one has albinotic eyes, according to the record. It seems exceedingly probable that the blue eyes in the case of 17 of these 52 children were blue albinotic irides, and that the "red eyes" of the brunettes among the 35 former children were not albinotic, but that the colour represents red brown or brick red tints as found by the recording teacher in certain irides, and is not albinotic reflex at all. Be this as it may, it does not seem safe to use this material, as some writers have done, to estimate the amount of albinism in Switzerland.

Persia, p. 49. We have succeeded in discovering an oral tradition as to Tamerlane. Joseph Wolff writing of Timūr Leng, the "Lame Timur," describes how intimately the Turkomans still speak of him and his exploits, as if they were of modern occurrence. Thus a mullah from Bokhara asked Wolff if Timūr was much spoken of in England and said that "he was of great stature, of an extraordinary large

¹ Die statistischen Erhebungen über die Farbe der Augen, der Haare und der Haut in den Schulen der Schweiz. *Neue Denkschriften der allgemeinen schweizerischen Gesellschaft für der gesammten Naturwissenschaften*, Bd. xxviii. 1881, Zürich, 1883, S. 1—42.

head, open forehead, of a beautiful red and white complexion and with long hair, *white from his birth* like Zāl the renowned hero of Persian History" (*Narrative of a Mission to Bokhara*, 1843—5, 7th ed. 1852, p. 243)¹. As to Zāl the Shāhnāma, or King's book, composed about 1000 A.D., recounts the *birth* of Zāl as well as the characteristics given in the citations on our p. 49. The warrior Sām according to Firdausi's sources had a child born to him without a single blemish, excepting that his hair was white:

His hair was white as goose's wing,
His cheek was like the rose of spring,
His form was straight as cypress tree—
But when the sire was brought to see
That child with hair so silvery white,
His heart revolted at the sight.

No human being of this earth
Could give to such a monster birth;
He must be of the Demon race,
Though human still in form and face.
If not a Demon, he, at least,
Appears a parti-coloured beast.

His mother called him Zāl, but the people said to Sām that it was an ominous event, and would be productive of nothing but calamity. Sām, owing to these reproaches, exposes the silver haired child on the mountain Alberz, whence he is saved miraculously, and restored to the penitent but aged Sām:

Dost thou believe
That to have silvery tresses is a crime?
If so, thy head is covered with white hair;
And were not both spontaneous gifts from Heaven?²

We owe to Professor C. E. Wilson another quotation as to Zāl from the Shāhnāma:

His eyelashes (are) white, (and his) eyes the colour of pitch;
(His) lips (are) like coral, and (his) cheeks like blood.

The word used for pitch is the Arabic word *kir*, but if applied to the pupils it is not necessarily final with regard to the albinism or incomplete albinism of a man of dark-skinned race.

China, p. 50. Mr Thos. D. Begg, a missionary, has been 22 years in China. Between 1888 and 1895 he saw 12 Chinese albinos near Whei-chow in Ngan-whi province, where there are said to be 20 albinos. It is a mountainous and poorly populated district. He noted red eyes, yellowish hair and freckles; he did not note nystagmus. Albinos, he says, are looked down upon by the Chinese, who believe they have foreign blood in them. Mr Begg thinks that there is no intermixture of races in Whei-chow. At Shanghai, where he has now his headquarters, there is a typical specimen of female albino two minutes from his house. Mr Begg informs us that the Chinese term for albino is *iang ren*, i.e. the contemptuous epithet of "foreigner." Dr John Rose (now of Inverness) has spent five years in China, principally in the employment of the Transvaal Chamber of Mines Labour Importation Agency. He was in Chin Wang Tao, province of Chihli, North China. Some 20,000 Chinese males, ages from 17 to 50, were medically examined. They came from the provinces of Chihli, Shantung, Honan and from Manchuria, and to a lesser extent from Shansi, Hubei and Szechuan. In addition to these coolies, Dr Rose has met many thousand Chinese; yet he has never once noted a Chinese albino. He has seen some Chinese with red hair and light skins, but he could not say for certain whether their eyes were blue, although he was inclined to think they were. He had heard coast natives asking the red haired Chinese in joke "whether their mothers had known any missionary," although there were probably no white men within 150 miles of their districts.

Dr A. H. Skinner of Hankow considers that albinos are few in China and conspicuous when they occur. Visitors are apt to confuse them with half-castes; he has noticed one or two among the coolie labourers in the streets. There is a report of an albino colony about twenty miles from Hankow.

Just as this sheet goes to press Dr Souter and C. H. Usher have received from Dr Skinner of Hankow some fine photographs of Chinese albinos (see our Plates VV. and WW.), and further records of Chinese albinos. Dr Skinner most kindly circularised his fellow medical men in China and sends the following details:

¹ A Punjabi student spoken to by K. Pearson (Jan. 1910) knew well the legend of Timūr's white hair, and said it was given in the Persian Reader used in some of the schools of India.

² For the above account see *The Shāh Nāma*, by James Atkinson, pp. 71—3, London, 1832.

Dr F. F. Tucker of Pangkiachwang, Shantung, has seen eight years' practice in China; in 1909 he saw 547 hospital patients. He has never seen albinos in hospital work but two when travelling, and heard of a few others, but the information is not definite or exact. The local(?) name for albino is *pai t'ou lao*. An assistant tells him that among the natives it is often considered "that the excessive evil of parents causes a child to be dyed *in utero*"; this is the only explanation given of albinism.

Dr O. T. Logan, of Changteh, Hunan, has seen 12 years' medical work in China, and saw about 5000 hospital patients in 1909; he has never seen a case of albinism in the hospital, but he has seen two elsewhere.

Dr Thomas Gillison of Hankow, Hupeh, has had 27 years of hospital practice in China, and saw, perhaps, 3500 patients in 1909. He has seen not more than, perhaps, half-a-dozen albinos since he has been in China. Of localised white patches, cases of leucoderma, he has seen eight or ten in all.

Dr A. R. C. Father who has been three years in Changsha, Hunan, has seen three albinotic cases in and about that city, mostly beggars or hawkers. They had white or reddish hair and always a ruddy complexion.

Dr E. M. Merrins of the Boone Medical School, Wuchang, says that in that town reputed to have about 250,000 inhabitants, there are certainly two cases and possibly a third case¹ of albinism. The first is a young fellow, a pedlar in the streets, who is now in Hanyang². The second, a woman, is an undoubted albino (see our Plate VV. (160)). She is a beggar³ aged about 55. Hair and eyebrows quite white and have always been so; complexion ruddy; face so dirty it was hard to determine if freckled. She has muco-purulent conjunctivitis, corneal opacities, etc., so that the lids can hardly be opened and her condition was such that it was impossible to examine the eyes for points of albinism. She says no ancestors or relatives—she has no children—were albinos.

In Wuchang the name used is *pê t'eo fah* = white head hair. The small commercial dictionary gives *ih peh ren*, the strange, foreign, rare white man, and on the streets they are sometimes called *iang ren* = foreigners.

As to the cause it is believed—by how many Dr Merrins does not know—that a person is born an albino because the mother ate the flesh of sheep, *i.e.* inasmuch as the eater partakes of the nature of things he eats, one who eats mutton will have light woolly hair, or the children will have such woolly hair.

Dr Webb Anderson, Falshan, Kwangtung, has seen ten years' hospital practice in China and many thousands of patients. He has met only one case of albinism, not seen in hospital work. He gives as the Chinese name for albino *tin lo* = "Heaven's venerable," or *kong pak pang* = Heaven's white disease. These names suggest a respect for albinism, which is certainly not manifest in other Chinese districts.

Dr G. Duncan Whyte, Swabue near Swatow, Kwangtung, has had six years' practice in China. He himself has seen in the street one doubtful case and gives a full account of one case he has heard of. In this case the woman, now dead, had the body whiter than a European, with no patch of ordinary colour, the hair, eyebrows and eyelashes were quite white. The irides were white, but pupils dark and no red reflex noted; there was photophobia; the vision must have been fair, for she could repair nets. Her mother and maternal grandmother were only children, and husbands "were brought in for them"; the husbands, men from other provinces, were thus presumably in no way related. The albino was third in a sibship of five; the 1st and 2nd males and the 5th a female died of phthisis. The woman has had two children of which the first died one week old, and the second, aged 13, is healthy. No relatives have shown any pigment abnormality.

Dr G. Preston Maxwell, Yung-chun, Fukien, has had ten years' practice, and examined in 1909, 3000 patients. He has seen three albinos (one adult and two children) in hospital practice and two more (one adult and one child) elsewhere. He has heard of four others in the southern half of Fukien⁴.

¹ Dr Merrins has not been able to see this case, and from the description he doubts if it is one of genuine albinism.

² "I have tried hard to get him, but he will not come."

³ "Yesterday the old woman came to the Hospital and raised quite a rumpus. She said that the taking of her photograph had made her sick and taken away all her good fortune....I had to buy her off, and I shall not be at all surprised if we have to pension her for life. So you see where scientific investigation is in danger of landing us! Seriously though it is quite probable that you will not receive many photographs because the fear has not yet departed—I thought it had—that photography somehow affects the personality and destiny."

⁴ He is just leaving for a year's furlough and promises further details when his note-books are again accessible.

Dr Samuel Cochran, Huai-yuan, Amhui, has had 11 years' practice in China, and saw in 1909, 2560 hospital patients. He has never seen cases of albinism in hospital practice, but has met three or four casually on the street. The Chinese call them *peh kong*.

Dr Cecil F. Davenport, Shanghai, Kiangsu, has had 20 years' hospital practice and seen 20,000 to 30,000 patients. No albinos have been under treatment, but he has seen two or three cases elsewhere and heard of a few others. The Chinese call albinism "white hair" or "sheep white hair." They liken it to a sheep's fleece and say it is through eating mutton.

Dr A. H. Skinner saw on Bund at Hankow, a stout, well-built albino man, aged about 40 and apparently a countryman. Queue practically white, face very ruddy and resembling the photograph of albino, Plate WW. (161).

Dr McAll, Hankow, sent, since letter cited below, a beggar albino woman, aged 34, round to Dr Skinner's hospital to be photographed, but she fled before the operation could be carried out. Her hair was almost white; irides plentifully streaked with bluish white lines on darker ground; eyesight much impaired.

Almost all the above medical men had seen, some fairly frequently, cases of leucoderma.

Dr D. Landsborough, with 13 years' practice in Formosa, had seen no case of albinism but a good many cases of leucoderma. Dr Whyte sends us a photograph of a case of partial leucosis, possibly leucoderma, which is interesting; it was taken by Dr Cousland some years ago. If it does not represent a congenital piebald, it will at any rate serve to complete our illustrations of leucoderma in various races (see Plate WW. (162)).

Dr Skinner himself reports a case of albinism in Hankow, a Chinaman, Ning Fuh Tai, aged 36, widower, no children. His mother, normal, came originally from Honan, driven thence by poverty; he knows nothing of her family. His father, a Hankow man, married at age 27; he had two brothers of whom no particulars. The albino himself is fifth in a family of six; the eldest sibling, ♂, is alive and has a son and grandson, the second and third siblings are dead, then follows a sister with four normal children, the fifth is the albino and the sixth sibling a male. The two brothers and the sister are strong and well. The albinism of Ning Fuh Tai was attributed to some mistake or oversight in regard to the burial or care of the tomb of his paternal grandfather. Ning Fuh Tai's skin is fair, there are no freckles or pigment spots. Hair: scalp, light brown; eyebrows, almost white and thin; eyelashes, white, scanty, lower practically nil from earlier blepharitis; body hair nearly white, plenty in axilla and on pubes; for the rest very little or nil. Eyes: neither amblyopic, but both are highly myopic; fixes with his L. eye. Vision R. and L.: counts fingers with difficulty about ten feet; conjunctivitis and blepharitis of L. lids. Iris: grey-blue, a little rusty pigment in a circle round the pupil, but not quite at the pupillary margin; no pigment at the corneal margin; no redness of pupil; marked concomitant internal strabismus of R. eye; marked lateral nystagmus, about every second or oftener when excited; no photophobia. Examination of fundus not easy on account of nystagmus and myopia; pigment seems to be present in normal degree and distribution, except at the temporal side of the discs, where the pigment of choroid seemed to be scanty and to be arranged in small circular patches, each rather smaller than the area of the disc (see Plate WW. (161) and (164)). At the Roman Catholic Mission Hospital in Hankow, two brothers, aged about 30, who had come to bury their mother, were noticed (17/2/10) to have streaky brown hair; their eyes were healthy, but the irides in each were of a light green colour; they had one brother at home who had black hair. Their complexions were ruddier than is natural with the Chinese. Their mother, whose hair had become white, had formerly had brown hair. They denied possible European blood. They belong to Mei-iang-dso, a place 400 li (= 133 miles) up the Han river. In Hanyang, in February 1910 also, a well-marked albino was passed, selling water chestnuts in the street (see Plate WW. (163)). No particulars could be obtained, but a snapshot was taken before a crowd collected. He would not hang his pigtail to the front; his eyes were pale and he seemed to have photophobia. Hair of the head nearly white; eyebrows pale and scanty. As far as the local mission doctors can learn there is no special Chinese word for albinism. In the local Hankow pronunciation the cases of which Dr Skinner sends photographs are termed *bāh-pīh*, i.e. white skins.

Dr Skinner remarks that the number of cases seen in the three cities, Hankow, Hanyang and

Wuchang by the missionary and other medical men is very small. They may possibly be overlooked, being confused with Eurasians. It will be obvious that the cases reported by Dr Skinner appear to belong to the less complete form of albinism such as we have already noted in the Philippines. Dr McAll in a letter to Dr Skinner (dated Hankow, Dec. 27, 1909) said that he had then never seen a case of genuine albinism in China, the nearest case to it being a big coolie who frequented the Concession a few years ago and whose hair was a light brown. He remarks that the Chinese of classical times called themselves "the black-haired race." Dr Skinner also notes that the Chinaman's hair is usually strong, coarse and coal-black, but that there may be shades of dark brown approximating to black of a degree not likely to be noticed except by some one making comparisons. At any rate the above report is of considerable value as showing the existence of incomplete albinism and possibly xanthism in China. Whether these incomplete cases are relatively more common than complete albinism (of which only two or three cases have hitherto been put on record: see p. 50), or whether more are allowed to survive childhood it would be impossible to say. But we have in China, apparently, as in the Philippines and among the negroes, just the same wide range of albino grades, which exist, although less marked, among the white races.

India, p. 51. John Davy, 1839, speaks of albinos as being frequently seen in Ceylon, and of one in particular he writes: "The young albino, 12 years of age, in England and certainly in Norway, would not be considered peculiar, for her eyes were light blue, and not particularly weak; her hair of the colour that usually accompanies such eyes; and her complexion fresh and rosy. She had considerable pretensions to beauty, and was not without admirers among her countrymen. It is easy to conceive that an accidental variety of this kind might propagate, and that the white race of mankind is sprung from such accidental variety. The Indians are of this opinion, and there is a tradition or story amongst them in which this origin is assigned to us" (see Bibl. No. 237).

Pyrard de Laval, in 1679, writing of the Maldiv Islands which lie south-west of Ceylon, says that among the native olive-coloured women there are some as white as Europeans; this probably refers to albinism (see Bibl. No. 33).

Dr Robertson Milne says that during his seven years' experience among the natives of Lower Bengal he has seen several albinos; he mentions a family of albinos, high caste Brahmins in Berhampore.

Negelein (*Die volksthümliche Bedeutung der weissen Farbe*, *Zeitschrift für Ethnologie*, Bd. xxxiii. S. 55, Berlin, 1901) considers that the word *sita-asita-roga* occurring in a Sanskrit MS. at Berlin, and given in the St Petersburg Sanskrit Dictionary, really denotes albinism, and that accordingly the early Indian medical men had already recognised albinism as a definite phenomenon.

Siam, p. 51. The journal of Mr Peter Williamson Floris tells us that in Siam "in 1605 the Black King died without issue and left his dominions to his brother the White King, who was a covetous Prince but enjoyed his Kingdoms in peace," Thos. Astley, *A New General Collection of Voyages*, Vol. i. p. 39, London, 1745. This may be compared with the legend of the Black and White Kings of Madura: see our p. 65 fn. Is it possibly a case of albinism?

South America, p. 105. An informant home from Rurrenabaque, 20 days journey from La Paz in Bolivia, states that he has seen 500 to 1000 natives; they speak *takana*, have almond-shaped eyes, black straight hair, no beard or moustache, and an olive coloured skin lighter than the Japanese. He has not come across a native albino. Bollaert¹ and Wilson reported a red-haired Indian woman at Canelos in Ecuador. Kittlitz² mentions fair-haired people in the south of Chile. Blake apparently had found red hair attached to a skull from an Indian tomb in Peru. Camargo noted also fair hair among Indian remains, while the traditions of various American races refer like the Persian legends to fair-haired heroes³. Thus Camaxtli, a hero of the Chichimèques-Toltèques, was white and fair-haired⁴. Still more recently (March 14, 1910), Major P. H. Fawcett, in summing up to the Royal Geographical Society the results of his three years' experience in Bolivia, referred to the old story (see our pp. 17—18)

¹ *Journal Anthropol. Society*, Vol. vii. p. clv. London, 1869.

² *Denkwürdigkeiten einer Reise*, Bd. i. S. 128.

³ *Bull. Soc. d'Anthrop.* T. iii. pp. 424—431.

⁴ *Bull. Soc. d'Anthrop.* T. iii. p. 214. It is somewhat vaguely asserted on p. 213 that the Lipanis, a tribe of the Apaches in Southern Mexico, have white hair.

of a tribe of white Indians in the remote interior. He stated that he himself had met half-a-dozen men who emphatically declared that they had caught glimpses of white Indians with red hair. The "wild" Indians are said to have affirmed the existence of a white race with blue eyes, and given this people who travel and hunt by night but hide by day (cf. our pp. 22—25) the name of *Morcegos* or "Bats." It is possible that all the above Indian reports are associated with cases of complete or incomplete albinism.

North America, p. 107. Mr H. B. Townshend in a letter to E. Nettleship, Dec. 29, 1909, states that in 1903 he was in the Hopi (or Moqui) pueblos of Arizona. "The Hopi Indians live on seven hill-tops in the Painted Desert, and are probably very little mixed in blood with whites. I should say nearly 5 per cent. of them were albinos. I have rarely seen any albinos elsewhere among the Red Indians...The Hopi are lighter coloured than most of the Indians I know, and their features differ to my eye so little from Europeans, that I remember long ago suggesting to Tylor the possible starting of a white race not unlike ours from such origins. I believe I have seen in the fair, freckled, Irish peasant type some faces very like Hopi albinos. Of course there is the difference of the Indian hair in texture."

Negro Albinism, p. 116. At the kind suggestion of Dr G. A. Turner, Dr. G. H. Coke, Medical Officer, Government Native Labour Bureau, Germiston, Transvaal, sent to K. Pearson (Letter, February 17, 1910) the following report on the only cases of partial albinism, abnormal pigmentation and xanthism occurring among 5000 South African natives recruited from British territory for work on mines in the Transvaal. They were examined at the Government Labour Bureau Compound at Driehoek during November, 1909. No case of complete albinism was seen. The first two cases may have been either congenital or leucodermatous, the third case is reported as congenital and the fourth and fifth are clearly cases of xanthism.

Notes on cases of Xanthism and Abnormal Pigmentation in South African Natives.

(1) A Xosa adult male showed the following white patches: upper part right ear white; an irregular white patch on right cheek about size of a penny; left ear white with small spots of black in the white area; three small white patches on left cheek, the largest being nearly as large as a haricot bean.

(2) A Basuto adult male from Basutoland showed (1) a white patch nearly the size of a five-shilling piece just below the left clavicle, (2) a small patch about the size of a haricot bean in left axillary line just below the crest of the ilium.

In the above two cases the skin of the patches is not yellow but white and to all appearance indistinguishable from that of a white man.

(3) An adult male Xosa with a well-marked pigmented patch many shades darker than the remainder of his body, extending from the left nipple outwards and around the left side of the body over the left scapula and to within three inches of the spine. The patch forms a band of about eight inches wide, and the native states he was born with it.

(4) A young adult male Xosa, known as an *umfaan* at this age, with copper-coloured skin instead of the usual colour. Irides light brown, no nystagmus; hair very light brown, and curly. States that parents were the usual colour; has four sisters one of whom is of a similar colour to himself, the other three being black like their parents.

(5) A copper-coloured male Xosa, but of slightly darker shade than the last. Colour of irides quite dark brown—no nystagmus; hair light brown and curly. States that both parents were of the usual colour and that there is no history of any light-coloured individuals in his family.

Blue-eyed Negroes, p. 158. The existence of *blue-eyed* negroes without other albinotic characters seems authenticated. Thus J. H. Patterson writes (*In the Grip of the Nyika*, London, 1909, p. 285): "I noticed, however, that the Rendile were somewhat taller and more spare in figure than either the Masai or the Samburu. Some of them had quite blue eyes which is most unusual in an African."

Red-haired Negroes, p. 130. Further evidence of red hair among the black races has been collected by Andree¹. Thus Walker² saw a pure-blooded negro with red hair, eyebrows and eyelashes.

¹ *Zeitschrift für Ethnologie*, Bd. x. S. 335—45, 1878.

² *Journ. Anthropol. Soc.* Vol. vi. S. lxii., 1868.

Munzinger¹ says that among the Beni-Amer, red, fair and quite light hairs occur. Pechuel-Lösche² saw a dark-skinned negro with red hair in Kinsembo, another on the Bonny river and a third, a Kroo negro, at Cape Palmas. The general relation of albinism to red hair will be discussed later.

Southern Nigeria, p. 134. Dr J. G. Copland reports from Owerri station in the district of Owerri, 23 miles from Oguta, a town in the eastern province of Southern Nigeria, the following five cases of albinism:

(A) ♀ albino, age 20 to 30, frequently seen. Skin light, hair nearly white; constant nystagmus, pink pupils, slaty iris, marked photophobia; no recollection of any freckles on trunk or limbs which were exposed to sun. From enquiry no other albino known among her relatives.

(B) ♂ albino, boy, servant of a chief, 10 miles from Owerri. Description of hair, eyes and skin exactly as (A); no relation affected.

(C) ♂ albino, age over 50, 12 miles from Owerri on road to Oguta; was dressed like a Ju-Ju man (i.e. medicine man). All external appearances of albinism, red pupils, nystagmus, photophobia, fair hair and skin.

(D) ♀ albino, age about 30, seen about eight miles from Owerri; hair nearly white, skin blond; constant nystagmus, red pupils, photophobia. Nothing known of history, was sitting among a crowd of other natives, but seemed to take no interest in what was going on.

(E) ♂ albino, age about 30, at Degama in Degama district. Hair creamy white, thinner and shorter than usual, much white hair on body; skin fair, rough, coarse and thick in appearance, smelt badly, but not ulcerated; constant nystagmus, iris slaty blue, red pupils, no strabismus, intense photophobia; seen twice, he was a prisoner and very repulsive.

Dr Copland thinks he has seen in his year in Nigeria seven other albinos, but does not recollect particulars except that all the albinos were similar in having red pupils, blue-grey irides, photophobia, no strabismus, hair nearly white or creamy white, fair skin and certainly without marked pigment spotting or anything like the spots or freckles of the Fijian or New Guinea albinos. Dr Copland has never seen a piebald or apparently the graduated incomplete albinism of some other districts. All the cases were among the Ibo race; the Ibo natives keep to themselves, though there are occasional marriages with Yoruba soldiers. Albinos are treated like ordinary natives. The Ju-Ju produces them; the natives attribute to the Ju-Ju anything they cannot otherwise account for. Owerri, Dr Copland's station, is about 150 miles from the coast.

Nyassaland, p. 145. Dr John B. Davey on a visit to this country (June, 1910) not only brought specimens of the Nyassa piebalds' hair, but reported a further case of albinism, which he came across at Nkomo village, headman Mbalasati, in Marimba district near Kotakota. The child, a boy, said to be four years old, was very freckled, especially on the back of the trunk and the front of the chest; hair flaxen, irides muddy-brown centrally with bluish patches at periphery, pupils black, no red reflex observed, but Dr Davey had no ophthalmoscope with him; much photophobia and ophthalmia; nystagmus in vertical and horizontal directions; body covered with sparse flaxen down. There was one normal child of the same mother about three years old. Both parents normal, but the paternal grandmother had many white and a few black hairs, probably only a senile change such as is not very unusual among natives. The paternal grandfather and both maternal parents said to be normal, as well as four or five brothers and sisters of the father now dead. Specimens of the hair of paternal grandmother and albino and a very good photograph of the family (see our Plate VV. (159)) were provided by Dr Davey.

¹ *Ostafr. Studien*, S. 336.

² *Globus*, Bd. xxxiv. S. 124.

CHAPTER IV.

THE ALBINOTIC SKIN. (HISTORICAL AND THEORETICAL.)

OF the three principal factors on which the superficial diagnosis of albinism depends, the skin has possibly been less studied than either eye or hair. While the number of albinotic human eyes which have been dissected, microscopically examined and reported on in print could probably be counted on one hand, the cases of microscopic skin examination appear to be still fewer. It is possible that nothing had been published on the post mortem examination of the skin of the human albino between Adler and McIntosh's paper of 1910 and Buzzi's historic paper of 1784¹. Buzzi's results, the absence of the *rete mucosum* at all the points of the skin tested by him, and the absence of the *uvea* from the eyes, would hardly be accepted now, and were probably merely based on the absence of the pigment by which he had been accustomed to identify these structures. Other early writers contribute little of value to the subject, but they are worth consideration historically because they mark the separation of such writers into two schools, which in a certain sense have persisted to this day, and the fundamental problems of which are really not yet solved.

The one school looked upon albinism as a disease originating in the new individual directly or through the intrauterine influence of the mother. This conception is very primitive, current among many uncivilised peoples and largely self-protective. Nor can we be certain that any distinction was or could be made in early days between congenital cases of partial albinism and cases in which pigmentless patches were acquired and spread owing to definite disease. It is, indeed, conceivable that the normal members of a stock, where partial or complete albinism is hereditary, may exhibit a suitable field for the invasion of a disease affecting

¹ Bibl. No. 95. It should be noted, however, that Buzzi macerated portions of the skin from the wrinkles of the abdomen where the "corps muqueux" might be supposed most abundant. Wharton Jones, 1833 (Bibl. No. 202), did not find the *rete mucosum* absent but reduced to a very rudimentary condition, while the general development of the skin was not less normal. Bowman, 1849 (Bibl. No. 248), found the *uvea* present as Wharton Jones had done, but not differing in structure from that of the normal eye, only in absence of pigment. Manz, 1878 (Bibl. No. 357), considers that a defect of structure exists as well as a want of pigment. It is possible that the two things are necessarily correlated. In any chance of further investigation with modern technique on the albino skin—and any such investigation would be of much value—the question of rudimentary structure as (a) an independent factor of albinism, (b) as a result of absence of pigment, or (c) as the possible cause of absence of pigment, might well be borne in mind.

pigmentation¹. As we find a white lock of hair occurring in stocks where we also observe complete albinism in other members, so it is possible to note skin patches of white in stocks where complete albinism of the skin may appear². Considering the three chief factors, eyes, hair and skin, we know that in many cases of reported albinism, there has been improvement in the condition of the eyes³, or the hair has become markedly lighter or darker⁴. Under the circumstances it seems possible that in such cases of "imperfect albinism" the skin condition may not be stationary. Indeed there have not been wanting authorities who have asserted that environmental conditions, moisture, heat and light, even diet, could not only produce albinism, but were serviceable in reducing its intensity, at least in cases of imperfect albinism⁵. The conflict is here between the weakness of

¹ In this matter Dr Joseph Jones' case (see our Fig. 286 and our p. 154) is of special interest; also the instances referred to later of hereditary leucoderma. Given a case of leucoderma and of partial albinism, no definitions at present given enable distinction to be made between the two without a knowledge of the history of the case. Thus Crocker's definition (see our p. 199) involves "symmetry," which may be as marked in partial albinism (see our Chapter VI.), "progressiveness," which demands a knowledge of history, and combination of "excess and deficiency," which is not invariable.

The evidence for change in eyes due to leucoderma is given in our Chapter V. and is very slight, but there are many cases of incomplete albinism with normal eyes. Thus we find cases of complete albinism of hair and skin only, and in cases of congenital partial albinism like that of the Jewish girl in our Plate J. (29) and (30) we find the white patch can, as in leucoderma, affect the neighbourhood of the eye, causing white eyelid and eyelash without influencing the pigmentation of the eye itself.

The loss of hair pigment with leucoderma is well known; we may cite the cases reported by Oliver (1821, *Dict. de Médecine*, T. xvii, Obsn. ccvii, p. 369, also Eble, 1831, Bibl. No. 196); Hutchinson (*Lond. Hosp.*, Clinical Lectures and Reports, 1864, p. 7); *New Sydenham Society, Atlas of Skin Diseases*, Part I, 1869, p. 36); Kaposi (1874: see Bibl. No. 333, p. 179); Flatau (1893: see Bibl. 445, S. 774); and others referred to in detail in our Chapter on Leucoderma. On the other hand, J. Brown (1824: see Bibl. 183, p. 668) reported the case of a negro, whose skin turned white after a surgical operation, but the hair did not lose its pigment. Erasmus Wilson (1855, *Portraits of Diseases of the Skin*, Account of Plate H, "Leucopathia or Partial Albinism") states that the hair on leucotic patches of a patient suffering from leucoderma, did not change, but this was in all probability a case of Addison's disease.

² See our Figs. 104, 286, 419, 544 and 643.

³ In the following cases the eye pigmentation was reported to have changed: Doyère (a doubtful account, cited by Cornaz, Bibl. No. 256, p. 383), Michaëlis (see our Fig. 352), Blumenbach (see our Fig. 405), Meyer (see our Fig. 607), Graves (see our p. 6), Wilde (Bibl. No. 285 and our p. 36), Rhode of Augustenburg (Bibl. No. 104), Ascherson (Phoebus Bibl. No. 207 and our p. 6), Sybel (Bibl. No. 130, p. 56), Rau (Bibl. No. 236, S. 290) and Herzig (Bibl. No. 211).

⁴ In the following cases the hair was reported to have grown lighter: two children, 8 and 10, mentioned by Rayer (Bibl. No. 179, p. 193), hair blond, grew whiter with age. In the following cases the hair was asserted to have become darker: Michaëlis, Graves, Ascherson, Wilde (see references in previous note), also our Figs. 1, IV. 6; 22, V. 18; 47, III. 2, 3, 5, 7; 82, IV. 2; 86, II. 3; 96, IV. 4; 97, III. 5; 120, IV. 6; 122, III. 6; 138, III. 1; 142, III. 2; 198, III. 2 & 3; 323, III. 6; 338, I. 1; 397, II. 3; 445, IV. 3; 488, III. 1 & 2; 537, II. 3; 566, V. 6. The changes here go beyond the yellow tinging of the tips of the hair common in albinos, especially in summer; see Cornaz (Bibl. No. 256, p. 376).

⁵ On the other hand Sichel, by a course of light and air and of eye training and exercise, did not succeed in lessening the chief characteristics of a complete albino child, but did succeed in lessening to some extent the inconveniences due to the nystagmus and photophobia. Cornaz (Bibl. No. 256, pp. 389 et seq.).

the structure which is characteristic of the albino and the therapeutic effects of light, air and exercise¹. It is not always clear whether the authors who assert an environmental influence on the production of albinism, mean that the influence has been exercised on the individual albino or on the parents or forebears of such albino. Thus Blandin ascribes albinism to humidity (Bibl. No. 191, p. 454), but the only evidence he gives for this statement is that the albino idiot at Bicêtre appeared to grow healthier when he was removed from a damp to a dry room and given more air and exercise. There is no evidence that his essentially albinotic characteristics were changed any more than in Sichel's case. Furnari in his *Voyage médicale*, 1845 (Bibl. No. 239, p. 178) states the general medical impression of the first half of the nineteenth century on the source of albinism, with the customary want of anything like definite proof:

Comme M. Guyon (Bibl. No. 223, p. 730) nous pensons qu'il faut ranger parmi les principales causes de l'albinisme en Afrique, surtout parmi les juifs, l'humidité, l'insalubrité, le défaut d'air et de lumière: toutes circonstances qui reproduisent assez bien les mauvaises conditions des localités où l'albinisme est le plus fréquent. Ainsi quelques auteurs avaient déjà remarqué que c'est à l'isthme de Darien une des contrées de la terre les plus humides qu'on rencontre le plus grand nombre d'albinos. On sait d'ailleurs que l'albinisme sévit fréquemment sur les animaux mal nourris soustraits à l'influence de la lumière et privés d'exercice; c'est ainsi que Saint-Hilaire a constaté que des mammifères et surtout des singes tenus dans une captivité prolongée, privés d'exercice et nourris d'aliments insuffisants, ou peu en harmonie avec leurs besoins, subissaient insensiblement une alteration notable de couleur; on sait même que ce naturaliste a provoqué l'albinisme chez de jeunes cyprins dorés de la chine. Enfin Roche, le plus ancien de Albinos de Bicêtre, a présenté des symptômes beaucoup plus saillants tant qu'il a été placé dans une loge sombre et humide; mais depuis qu'on l'a fait coucher dans un endroit sain et aéré, qu'on l'a laissé circuler au soleil et dans les grandes cours, et un mot qu'on l'a soumis à l'influence d'agents toniques et excitants, les caractères de l'albinisme se sont vivement amendés, la constitution s'est fortifiée et il est aussi vigoureux que le comporte l'âge de cinquante-trois ans qu'il vient de dépasser.

This passage well sums up the ideas current on albinism during the first half of last century, and reproduces the stock case of Roche, which is taken from the French medical dictionaries, and is not there recorded with the accuracy needful to demonstrate a fact,—a general increase of physical health might be quite sufficient to account for everything recorded².

The conception that damp sunless districts were responsible for albinism doubtless received impetus from the reported cases from the forest tribes of Java, Ceylon and Amboina³. But the direct experimental evidence to which Furnari alludes is far from conclusive. Saint Hilaire's results are stated in the *Histoire générale* (Bibl.

¹ Weakness of structure is probably the source of the correlation between albinotic skin and eruptions, scrofula and wounds so often observed in negro and other native albinos, subject to strong sun with little or no protection from clothes.

² See our p. 38. Wilde in 1862 considered that there was as yet no evidence to show increased pigmentation followed any special treatment (Bibl. No. 285). Erasmus Wilson in 1855 believed that he had produced effect on leucodermatous patches, but in this case there had been melanodermatous as well as leucodermatous variations in the subject, and the leucosis had previously been retrograde (*Portraits of Diseases of the Skin*, Plate H). It was afterwards recognised that this was probably a case of Addison's disease, not leucoderma at all.

³ See our pp. 16, 22, 24.

No. 203, pp. 298, 318), but they are not final from the standpoint of modern science. A somewhat similar set of observations are those due to Aubé (Bibl. No. 262), only he asserted that the production of albinos in rabbits and other mammals as well as goldfish was due to inbreeding, and declared that he could produce albinos at will in the case of the domestic rabbit¹. The series of experiments by which Legrain (Bibl. No. 304) professed to demonstrate that he had reproduced Aubé's results by means of unfavourable environment and without the need of inbreeding at all is one of the most remarkable forgeries in the history of science. It deserves mention here as Legrain's results have been cited to show that special environmental conditions can produce albinism.

While it is very difficult to grasp whether the old writers thought albinism was produced by the action of the environment on the individual or on the race, there is no doubt that in some instances they directly attributed it to a disease, or to a diet which produced disease. In many cases there was undoubted confusion of partial albinism with some form of skin disease. Thus Furnari found albinism frequent among the Jews of Africa, but as he found "taches de rousseur" in the eyelashes and eyelids instead of pure white, he considered the albinism incomplete, and he believed it, among the Jews of Algiers and Constantine, to be in the great number of cases non-congenital and the result of a scrofulous affection. He does not state that he has found it on inquiry to be non-congenital, nor does he give the particulars of the skin disease to which he attributes it. Another instance of the doubt whether partial albinism or disease is the source of special appearances occurs in the case of the so-called "spotted Tartars." The first mention we have found of them occurs in P. J. von Strahlenberg's book: *Das Nord und Ostliche Theil von Europa und Asia*, Stockholm, 1730. An English translation appeared in 1736 from which we quote²:

I have already alleged of the Tungusians, that they might likewise be called Picti; and I must add here that besides the Tungusian nation in Siberia, there was another Horde, formerly called Piegaga or Piestra [*i.e.* the spotted or speckled Horde]. But these are almost extinct except some few of this

¹ Aubé will not convince the modern reader that his rabbits were of pure breed to start with. He states that the offspring of a male and female of the same litter are grey spotted with white or more often pale red with spots. Two members of the second litter if interbred give black or black and white rabbits. Two members of this litter give blue-slate-grey rabbits and finally two of this fourth generation pure albinos. He compares this transition through black to albino with the case of sheep, and says that if rams are used with their offspring or sisters, black-brown lambs are often the result, black being the intermediate state between natural white and albino white. He does not state that two black lambs from the same mother would give an albino sheep, which would be the natural inference from his line of argument. Aubé states that albino birds occur most frequently in little-migrating species like partridges, jackdaws and sparrows. His rabbit-breeding experiments—in default of fuller information—seem to be very much what might flow from an original hybridisation followed by Mendelian segregation without any need of appeal to the effect of close inbreeding. A repetition on a pure breed of Aubé's experiments and a series like Legrain's fictitious breedings under favourable and unfavourable environments would throw some light even at the present day on albinism.

² *An Historico-Geographical Description of the North and East parts of Europe and Asia written originally in High German by Mr Philip John von Strahlenberg, a Swedish Officer*, London, 1736. See p. 173. In the original the paragraph is on p. 166.

kind dispersed here and there....I have seen a man of this kind in Tobolsky, whose hair was all shaved off, except about a finger's breadth. He had all over his head spots white as snow and perfectly round of the bigness of a Saxon double Grossch (or about the size of a shilling), which looked wonderfully odd. Insomuch that I then thought with myself, if this Tartar was in Europe he might be shown for a sight—but the people in Tobolsky made so little wonder at all of it that they only laughed at him. His body was likewise spotted and speckled much in the same manner; the white of the skin was soft and smooth, but the spots were blackish-brown, and the skin somewhat coarser; however the spots were not so regular as on the head. In my travels further into Siberia, I saw more of the like people, but speckled in a different manner; that is, on their heads, with spots not like those of a tiger, but like a py'ball'd Horse, viz. some long, some oval and others of another figure, and the same upon their bodies. Another I saw whose hair was one half of it white as snow, and the other half black. I asked the Tartars whether they were born so? Their answer was, some were, others got it by sickness. Such speckled people are common on the river Czulim and near the City of Crasnojahr on the river Jenesei among the Kistimian Tartars.

The "Spotted Horde" appears on Mercator's, the most ancient map of Siberia. S. G. Gmelin admits that Strahlenberg saw spotted individuals, but attributes the spots to a certain kind of leprosy which attacks the Kalmucks¹. The author of the *Histoire généalogique des Tartares* (p. 494) denies the truth of Strahlenberg's statement because he could not hear of them from persons who had been in those parts, and because if they had existed the Czar Peter the First would certainly have had some of them at his court (p. 494). Yet John Bell in his *Travels from St Petersburg in Russia to diverse parts of Asia*, 1763, Vol. I. p. 217, on the way from St Petersburg to Pekin in February 1720 writes :

The 20th we arrived at a Russian village called Meletzky-Ostrogue, where we staid a day....In the neighbourhood of this place we found many huts of these Tzulimm-Tartars, who seem to be a different race from all of that name I have yet mentioned. Their complexion indeed is swarthy like that of most of the other descendants of the ancient natives of Siberia; but I have seen many of them having white spots on their skins from head to foot of various figures and sizes. Many imagine these spots natural to the people, but I am rather inclined to believe they proceed from their constant diet of fish and other animal food without bread. This of course creates a scorbutick habit of body, which often breaks out in infants, and the scars falling off leave that part of the skin as if it had been scalded, which never recovers its natural colour. I have however seen several children with these spots who seemed healthy.

Strahlenberg's and Bell's accounts are of interest as showing again the doubt between a congenital and a disease origin for white patches. Bell's view that the disease origin may be due to a fish diet is of interest from a wider standpoint. Dr Thomas Winterbottom, a careful medical observer who spent much time in Africa at the end of the eighteenth century², writes as follows :

When black people receive any considerable injury to their skin from wounds, burns, etc., the cicatrix remains white through life. It is not uncommon to see persons whose skins have undergone a change from black to white, the appearance being confined to a small part of the body. Sometimes one or both hands and feet are spotted black and white, sometimes they are entirely white. The Bulloms

¹ *Histoire des Découvertes faites pour divers savans voyageurs*, Berne, 1779.

² *An Account of the Native Africans in the Neighbourhood of Sierra Leone to which is added an Account of the present State of Medicine among them*, London, 1803, 2 vols.

compare this disease to a caterpillar variegated black and white, which they call *umnah*, hence they name the disease *ker'umnah* or spotted worm. This change of colour is not produced by any injury done to the skin¹. The natives appear ignorant of the cause of this curious phenomenon. Some blame particular kinds of food as they do in *Kra-Kra*, while others more prudently confess their ignorance. Dr Isert [Bibl. No. 98] saw a negro whose hands and feet were perfectly white, a change which had succeeded a severe illness². Dr Clark of Dominica takes notice of this curious appearance and ascribes it to the eating of poisonous fish. "This fish poison," he says, "seldom destroys life entirely except the deadly poison of the yellow-billed sprat, as it is called, which kills very speedily; but those who have eaten of other kinds of poisonous fish are frequently reduced to the last extremity by the vomiting.... A singular effect of fish poison is to remove the epidermis in patches or spots about the hands and feet which continue white in people of colour and of a pale yellow colour in white people for life."

The nearest approach to anything resembling the *Spotted Tartars* is contained in the reports of much more recent date of the Central American *Pintos*. Tylor writing in 1861 (see *Anahuac, or Mexico and the Mexicans* ..., p. 309) says:

One of the strangest races (or varieties, I cannot say which) are the *Pintos* of the low lands towards the Pacific coast. A short time before we were in the country, General Alvarez had quartered a whole regiment of them in the capital; but when we were there they had returned with their commander into the *tierra caliente*, towards Acapulco. They are called *Pintos* or painted men, from their faces and bodies being marked with great daubs of deep blue, like our British ancestors; but here the decoration is natural and cannot be effaced. They have the reputation of being a set of most ferocious savages; and badly armed as they are with rickety flint- or match-locks and sabres of hoop iron, they are the terror of the other soldiery, especially when the war has to be carried on in the hot pestilential coast-region, their native country.

This is all Tylor says and it is not clear whether he had closely studied these *Pintos*.

Désiré Charnay in 1887 (see Bibl. No. 413, p. 499) gives a still briefer account:

In Tehuantepec are met the peculiar people known as "pintos," *painted*, no misnomer, for they are covered with sickly white patches extending sometimes over the whole body. The effect of these patches over their swarthy skin is most repulsive, and gives them the ghastly appearance of lepers.

We have already referred (p. 107) to D'Orbigny's mention in 1839 of "spotted men" among the nations "*mocétanès, tacanas et yuracarès*." In a footnote to the passage cited he says the Spaniards call them *hombres overos* "spotted men," and states that while Blumenbach refers to pied negroes as exceptional, these "spotted men" are universally met with. Professor A. Forel in 1897 (see later our chapter on Leucoderma) has also described widespread "vitiligo" among the Columbians,—

¹ Dr W. C. Brown tells us that mental troubles, pregnancy, etc., will not infrequently produce pigment vagaries, white patches all over the body in the case of Tamils, which pass by various names, as chloasma, vitiligo, etc. In Scheube's *Tropical Medicine*, edited by Cantlie, 1903, there is a good photograph of such a Tamil woman (p. 532) taken by Dr Edgar at Ipoh in the State of Perak, and described by some error as *pinta*, which is another disease, supposed to be, and described in the letterpress as being confined to the Western Hemisphere.

² Winterbottom has mistranslated Isert. In *Lettre VII*. Isert writes (March, 1785): "Je vis aussi un Nègre qui avoit les mains tout-à-fait blanches, et les pieds de même. Cela leur arrive quelquefois à la suite d'une maladie grave; celui-ci étoit né tel," thus emphasising the congenital character of this case.

appearing mostly in many small spots. The description corresponds fairly closely to those of the Pintos and spotted men. Forel apparently holds it to be congenital, thus disagreeing with D'Orbigny and leaving the matter in the state of doubt conveyed by Strahlenberg's account of the Spotted Tartars.

Putting such reports as those we have cited above together, is it much to be wondered at that the eighteenth century did not distinguish between acquired white patches due to disease and congenital partial albinism, or that it came to class albinism as a form of leprosy? Even the notion of a fish diet has been suggested as provocative in both cases¹!

That many native races look upon albinism as a skin disease, and possibly a contagious one, is scarcely to be wondered at; they are not capable of diagnosing superficial differences in appearances of hair, eye and skin. The Hindus according to Dubois (Bibl. No. 159) spoke of albinos as "lepers by birth²." Some African tribes do shun or have shunned albinos as dangerous or contagious (see our pp. 130, 135, 138, 139 etc.), and others consider albinism as a deformity if not also a disease (Winterbottom, Bibl. No. 136; Equiano, Bibl. No. 110, p. 21). It is not, however, these native impressions which led to the classification of albinism as a form of leprosy. This view arose among the older European scientific writers, although it was promptly contradicted by men like Winterbottom living among native Africans and in close contact with native albinos. Haller in his *Elementa Physiologiae*, Lausanne, 1763, Vol. iv. p. 492, is ready to accept albinotic races:

¹ The idea that humidity could in some way produce albinism has been revived in quite recent times by Poesche, 1883 (Bibl. No. 381). This author in a lengthy memoir endeavours to show that albinism is "eine Blutkrankheit, welche vielleicht die Bildung der Blutkörperchen hindert" (p. 147). "Blondheit" he considers a modified form of albinism = *leucopathia universalis imperfecta*. He finds not only the cradle, but the *raison d'être* of the blond races of man in the swamps of Russia between Baltic and Black seas. In short, albinism and to a lesser extent blondism are skin diseases due to a moist climate. Now it is true, as we have already pointed out, that albinism is often found associated with skin troubles (see our Figs. 20, 48, 73, 180, 231, 280, 348, 354, 390, 484, 518, 589 etc., etc.) but these are probably due to the weakness of the structure, which is correlated with, if not the source of, the want of pigment. There are also many moist districts in the earth, where blond races have not arisen, although some of the districts where albinos have been frequently reported have humid climates and swampy environments.

In a paper of 1866 (Bibl. No. 303, p. 364) the anonymous author says that Cornaz considered that vegetable food predisposed the mother to the bearing of albinos. We have been unable to rediscover the passage. Cornaz in his fundamental memoir of 1855 (Bibl. No. 256, p. 379) speaks of the influence of heredity and that of certain localities as being the only factors based on observation. Seiler (Bibl. No. 201, p. 52) considers that poverty, repeated child-bearing and generally poor nourishment cause women to bear albinos. There are recorded cases of delicacy in the mothers of albinos, but it is far from being the universal rule. If albinism were due to debilitating causes we should not expect to find with considerable frequency (see later) one only of two twins albinotic. If it were due to much child-bearing, the youngest children ought chiefly to suffer (see later).

² Dubois (writing in 1817) says that albinos in India are looked on universally with horror and their parents abandon them at birth. Their colour is supposed to arise from a sort of leprosy, and he himself favours this view. That this Indian dislike to the albino is at any rate maintained in some districts is evidenced by the tale of the *Bhut Baby* (albinism of hair) in Flora Annie Steel's *The Flower of Forgiveness*, p. 96: see Note, Bibl. No. 447, and also our p. 53.

Integrae etiam gentes nyctalopes sunt, quae rosea sunt choroidea, rosea iride, lucis ergo nulla parte suffocata. Ejusmodi sunt Leucaethiopes (*l*), Africani (*m*), & Americani (*n*), & Asiatici (*o*): toto die enim oculi eorum lacrimantur, ut noctu recte videant. Omnino probabile est ejusmodi esse heliophobas cuniculos cum choroidea rubra (*p*). [References: (*l*) Bibl. No. 34, (*m*) Bibl. No. 73 and von Gröben, see our p. 130, (*n*) Bibl. Nos. 44, 58, 59, (*o*) Bibl. Nos. 45, 58, 73, (*p*) Bibl. No. 55.]

But he has not yet reached the leprosy explanation. Nor can the leprosy conception be attributed to Pauw (1768—89) as is done by Jourdan (1818) in the article *Leucéthiopie* in the *Dictionnaire des Sciences médicales* (Bibl. No. 165), for Pauw has a wholly different explanation of albinism, and directly contests the relationship of albinism and leprosy (Bibl. No. 72 and our p. 176). Jourdan probably copied Hensler, who in his book on leprosy, 1790 (Bibl. No. 119, pp. 357—362) directly attributes to Pauw and Schreber the opinion that “Kakerlaken” are lepers.

Mir ist diese nicht unwahrscheinlich. Das sie Kranke sind, oder wenn sie anfanglich es auch nicht sind, doch nach einer geraumen Weile es werden, ist schon ausgemacht.

He then describes changes which he says begin with white patches on the skin. He is probably laying entire stress on cases of leucoderma confused with partial albinism. There is further little doubt that he was influenced by Blumenbach's *De generis humani varietate nativa* of 1775 (Bibl. No. 125). Blumenbach (p. 84) gives a list of writers who had spoken of albinos as having cadaverous or leper-like skins. For example, Vossius (Bibl. No. 29) says that the skin was not vivid white but cadaverous and *almost like that of lepers*. The Tranquebar missionaries in 1766 asserted that the natives called albinism white leprosy (Bibl. No. 70, p. 1283). Ludolphus in his *Historica Aethiopica*, 1681 (Bibl. No. 34, c. 14. 29), writes (English translation, 1862):

True it is there are some Whites among the Ethiopians in other places, but they look like the countenances of Dead Men, or as if they had the Leprosie; which other Authors also testify, but write withal, that it proceeds from some Disease in the Body, and therefore other Ethiopians avoid being breathed upon or touched by them, as believing them Contagious.

We do not know that in this description Ludolph is doing much more than expounding Tellez's description of the Abyssinians, who said that:

nonnulli etiam rubicundi sunt: pauci albicantes vel potius pallidi & exsanguis; ingrata prorsus albedine (Bibl. No. 27)¹.

Yet Blumenbach modifies these descriptions into:

Leprosos quoque facit albos Aethiopes Joh. Ludolfus, et Guineenses, Isaacus Vossius,

whereas these authors merely say that albinos' skin looks rather like that of lepers. Blumenbach himself had observed a Saxon albino boy with skin from which scales were easily rubbed off, and this scaly condition of the skin has been noted by several writers as we shall point out later. Such is the material on which the theory of

¹ This is practically an exact translation of Tellez: *Historia geral de Ethiopia*, 16, p. 29. He has no reference to leprosy.

albinism as a modified form of leprosy was based! It cannot be said to have a wide foundation. And it is marvellous how one author after another writing on albinism repeats the old views as established or worthy of consideration. Kurt Sprengler in his *Handbuch der Pathologie* of 1801 writes of albinism (Bibl. No. 134, Bd. III. S. 935):

Ich setze hinzu dass sie eine grosse Aehnlichkeit mit dem weissen Aussatz zu haben scheint wie auch schon Hensler gezeigt hat. Unterschiede giebt es freilich noch immer, vorzüglich wenn man auf den Augenfehler der Albinos sieht, welcher sich in dem Grade bei dem weissen Aussatz nicht findet. Aber denn muss man auch die in Deutschland beobachteten Albinos ganz von den amerikanischen und asiatischen absondern, weil sich bei jenem keine Spur von Kachexie äussert.

From this time onwards Hensler, Pauw (see p. 174), Sprengler and sometimes Blumenbach are cited as authorities for albinism being a form of leprosy. There is no attempt to test this theory by actual examination of albinos. We are not told whether the disease is supposed to be developed after birth or *in utero*, and if the latter whether the mother is the source of the ill¹. It will be at once obvious that any theory of albinism as a leprosy disease meets with insuperable difficulties when (a) its congenital nature, (b) the fact that it can occur in one of two twins, (c) the inheritance from the paternal stock, are considered.

The real origin of the disease theory of albinism lies in (i) observations which show that congenital albinism, even if apparently very nearly perfect in infancy, is not invariably stationary, (ii) the readiness with which the albinotic skin, probably owing to defective structure, develops skin troubles, and (iii) the confusion of partial albinism with leucoderma and with more than one but little understood skin disease.

Before finally dismissing this early view of albinism as a disease, we may remark that albinism has been associated—in a manner entirely wanting in scientific exactitude—with a second diseased condition, namely cretinism.

The first reference to a relation between albinism and cretinism that we have come across² occurs in Pauw, the most unscientific of all the historians who have professed to deal with the philosophy of history (1768—1789, Bibl. No. 72). He indicates no case in which albinism has been found combined with cretinism, but takes his details as to cretinism from a “Mémoire de Mr le Comte de Maugiron, lu à la Soc. Royale de Sion.” We have not been able to see this memoir, and so ascertain whether de Maugiron had observed any cases of cretinism associated with albinism. Pauw writes:

¹ We put on one side the statement of Jourdan (Bibl. No. 165) that the albinotic condition “évidemment morbifique dans le principe peut en se transmettant de génération en génération cesser de présenter les symptômes de l'affection primitive à l'exception d'une faiblesse évidente tant au moral qu'au physique.” We are aware that stocks which show partial albinism (or even, perhaps, leucoderma, Bibl. No. 317, Pedigrees 286, 425) can produce perfect albinos. We know of no evidence of leprosy showing any relation to albinism.

² There is a paper by Foderé of 1792 (Bibl. No. 122) which sometimes is cited as associating albinism and cretinism. But Foderé goes no further than suggesting a relation between blondism and cretinism.

On ne sauroit mieux comparer les Blafards quant à leurs facultés, à leur dégénération, et à leur état qu'aux Crétins qu'on voit en assez grand nombre dans le Valais et principalement à Sion capitale de ce pays: ils sont sourds, muets, idiots, presque insensibles aux coups, et portent des goîtres prodigieux qui leur descendent jusqu'à la ceinture: ils ne sont ni furieux, ni malfaisants, quoiqu'absolument ineptes et incapables de penser: et s'abandonnent aux plaisirs des sens de toute espèce sans y soupçonner aucun crime, aucune indécence.

A more inappropriate description of the condition and faculties of albinos even in 1780 was, we think, impossible. In the literature to that date, we know of no reference to deaf-mute albinos, to none with goitre, and to none idiotic or wanting in all moral sense, except the over-quoted case of the albino idiot at Bicetre¹. Much later (1859, Bibl. No. 276) Dahl found two stocks in which albinism occurred in some, idiocy and deaf-mutism in other members. In 1871 Wilhelmi², however, found no single case of albinism among the deaf-mutes of the Regierungsbezirk Magdeburg, and a search made throughout the asylums of the London County Council for us by the kindness of Dr Mott only revealed one albino (Fig. 48) among many thousand imbecile and insane. We have, however, found elsewhere deaf-mute albinos. We shall consider in another chapter the appearance of defects and disease in albinotic stocks. These data do not, however, justify any sweeping comparison of albinos and cretins, mentally or physically.

The next stage in welding the link connecting albinism and cretinism was made by Tröxler in 1833. His paper, purely speculative, rhetorical and without scientific observations, asserts that "Leucaethiopy" is the second chief form of cretinism (Bibl. No. 200, p. 185 et seq.). The argument is based solely on a confusing analogy between "inner" and "outer" light, and the dislike for one involving an absence of the other. The mere absence of external pigment, he asserts, is not that which differentiates the albino from the normal human being, as various writers have supposed; it is only an external sign of the general physical and moral defect:

Der helle Tag blendet sie, darum hat man sie auch Blindlinge genannt; sie sehen eigentlich gar nicht oder schlecht, wenn das äussere oder innere Licht herrschen soll; also weder bey Tag noch bey Nacht, sondern nur in den zwey Tag und Nacht scheidenden Dämmerungen, "entre chien et loup," des Morgens und Abends, wie die das Licht hassenden moralischen Kakerlaken, denen man noch welche in Freyburg und Sitten, in Luzern und Chur findet. Wer das Licht nicht erträgt, hat auch keines in sich. Wie das Auge, so der Geist. Imbecillitaet in dem einen, wie in dem andern; die Farbe ist nur das Zeichen davon.

Notwithstanding the scientific worthlessness of Tröxler's paper—which it is kindness to suppose that those who adopt his conclusion have not examined—a relationship between albinism and cretinism, apparently on no further basis than the mere opinions of Tröxler or Pauw, has crept into medical literature³. The usual

¹ Overquoted because he appears to have been the *one* albino readily accessible to the French medical writers. There are, Dr Mott informs us, *several* cases of polydactylism in the London asylums. We are not, however, justified in inferring that polydactylous individuals belong to the insane class. The possibility of some correlation between various defects of development will be considered later.

² Statistik der Taubstummen...nach der Volkszählung von 1871. *Beilage zur Deutschen Klinik*, Berlin, 1873, S. 75.

³ It is worth noticing that Winterbottom entirely repudiated this association as far as negro albinos are concerned in 1803 (Bibl. No. 136).

form of statement made is that "Tröxler found cretinism often associated with albinism in Valais." We are unaware of any single recorded case of an albinotic cretin, nor of the association of albinism and cretinism in members of the same stock. Such records may exist, but we have failed to come across them. The origin of the statement lies in Pauw's inability to find anything more appropriate to compare with albinism, and in Tröxler's arbitrary action in making albinism one of the chief types of cretinism. Thus we see that there is even less basis for the cretinism-albinism myth than for the leprosy-albinism association. Both were originally based on the statement of writers seeking an analogy to the dead white hue of the albino skin—one found it in the "cadaverous or leperlike appearance," the other in the "pale, wan and livid" countenance of the cretin. Thus do myths take root and persist for generations even in scientific literature!

Somewhat less superficial treatment of albinism originated with Meckel, although the credit of his theory is usually given to Mansfeld¹. In France it met with the warm support of I. G. Saint Hilaire. Meckel writing in 1816 (Bibl. No. 158, Bd. II. S. 1—3) says of albinism:

Am gewöhnlichsten ist dieser regelwidrige Zustand angeboren, und auf gewisse Familien eingeschränkt, ungeachtet häufig eine oder einige Generationen übersprungen werden. Gewöhnlich, seltne Ausnahmen abgerechnet, sind die Individuen klein und schwächlich. Vielleicht kann man ihn als ein Stehenbleiben auf einer früheren normalen Bildungstufe ansehen, indem die weisse Farbe ein allgemeines Attribut der im Entstehen begriffenen Organismen ist, und von mehreren Beobachtern die Aehnlichkeit der Kakerlakenhaare mit Milchhaaren, so wie auch bey jungen Subjecten ungewöhnliche Länge und allgemeine Verbreitung derselben über den ganzen Körper bemerkt wird, und in einem von Siebold [Bibl. No. 105] beschriebenen Falle ein Stehenbleiben der Augen auf einer frühern Bildungstufe auch durch ihre Form angedeutet war, indem die Pupillarmembran auf beiden noch sechs Monate nach der Geburt persistirte.

It will be seen at once from this passage that Meckel describes as a *Stehenbleiben* at a normal foetal stage, what Mansfeld terms a *Hemmungsbildung*, that further he suggests as confirmation of this (a) the pigmentation absence, (b) the lanugo, and (c) the retention of the pupillary membrane—precisely the points used later by Mansfeld and Saint Hilaire. The one thing needed to round off this explanation of albinism is a reason for the *Stehenbleiben*. This Mansfeld in 1822 professes to provide. He defines albinism as:

eine Hemmungsbildung, verursacht durch allerlei während der Schwangerschafts-Periode einwirkenden psychischen Einflüsse [Bibl. No. 173, S. 373].

Mansfeld proceeds to account for the various degrees of pigmentation found in partial albinism, by remarking that the pigmentation in the foetus is progressive and the shock which produced the development-check may occur at a time when the eye pigment has already begun to be formed. This theory of Mansfeld, if correct, would allow us by a careful study of the foetal pigment changes to determine the period of the "psychic influence" which has produced a given albino. The occurrence of the supposed maternal shock (see p. 178) would we believe be found in most cases of complete albinism to post-date the first development of eye pigmentation!

¹ Meckel was probably following up a suggestion of Osiander (see Bibl. No. 155), "*Leucaethiopia morbus est connatus e pigmenti oculorum defectu scilicet universali carbonii foetus inopia ortus.*"

Mansfeld adds to Siebold's case one of his own, in which he himself saw the pupillary membrane five weeks after birth. There are other cases in which the albino has been said by the parents to have been blind for a few weeks or months after birth, but it is far from certain that this was owing to persistent pupillary membrane and not due to the chronic weakness of the albinotic eye. Even Siebold's case rests on not wholly satisfactory evidence. On the strength of this instance and his own observation Mansfeld is hardly justified in saying that the membrane is *often* present in albinos at birth, nor in using it as an argument for development-check. Still less are these two cases justification for the appearance of the pupillary membrane in a whole series of medical writings as a characteristic of the albino¹! Mansfeld carries his theory further by remarking that the greater tendency of the negro to albinism² depends on the fact that a negress who bears albino children is despised, and accordingly having borne one, she dreads the recurrence of the catastrophe; this dread forms the psychical influence producing "hereditary albinism" in later children, by which term we suppose Mansfeld means several albinos in one sibship.

In the case of Mansfeld's albino the mother had three epileptic fits in the first four weeks of pregnancy, a state of affairs probably largely responsible for Mansfeld's theory of albinism.

Isidore Geoffroy Saint Hilaire, 1832 (Bibl. No. 208), rendered an undoubted service to the study of albinism by his classification of its types (see our p. 8). He has added little to Meckel's theory that it is an arrest of foetal development. He refers to the fact of pigment coming late in foetal life and points out that negro babies are born light coloured, only attaining their dark pigmentation some time after birth. He also cites the lanugo on the skin of albinos as comparable with that of new-born and unborn infants.

From what has been cited it will appear that Mansfeld has added to Meckel's theory in a manner which admits of more direct criticism. In Mansfeld's adaptation of Meckel, the onus of the arrest of development is thrown on the mother, and on her state during the foetal life of her albinotic offspring. It seems very difficult on this ground to understand the existence of twins one normal and one albinotic, and yet 17 cases of such twins occur in our pedigrees. It is not easy to grasp how the psychical influence could reach one and not the other. Further it leaves out of account all cases in which albinism has manifested itself in the father's, but not in the mother's stock. Such cases appear in more than fifty pedigrees of our collection.

Meckel seems to have believed in heredity and not a "psychical influence" as the source of the arrested development. In a certain sense his theory must then be necessarily true, but it cannot be said to account for anything. If the distinction between the normal and the albinotic be assumed to be an absence of pigment, and if pigmentation normally begins to appear during foetal life, then albinism is distinctly

¹ It has yet to be shown that it is not statistically as frequent in non-albinotic as albinotic births. Another isolated case is recorded by Mr Herbert Fisher in our Fig. 86.

² This tendency has yet, we think, to be demonstrated.

an arrest of development. Meckel unlike Mansfeld having given no cause for this checked development does not expose himself to criticism, but at the same time he has explained nothing. His theory merely amounts to asserting that albinism is a pre-natal defect, not excess, of development. It is quite consistent with any modern theory which asserts that albinism is due to the absence of one or more development controlling determinants in either one or both parents. It is little more than the statement of an obvious fact, as far as concerns pigmentation. The retention of the pupillary membrane is, we have seen, not yet demonstrated. The existence of the lanugo in a considerable number of cases has more evidence in its favour. But if the fact be that all new-born babes possess it, and the albino alone retains it to adult life, the arrest to development whatever its ultimate source takes place not in pre-natal but post-natal life. If the arrest to development be identified with its ultimate source, then we may have to go beyond the pre-natal stage even to the cell divisions in which the parental gametes originated. In either case we reach little solid contribution to our subject unless we state—as Mansfeld attempted to do—the cause of the arrest.

We have already pointed out serious difficulties in accepting Mansfeld's theory, and further criticisms could be brought against it were it worth the labour¹. The complete albino has no pigment in eyes, hair or skin. The pigmentation of certain parts of the eye begins early, therefore the "arrest" must be early, and to complete the theory the skin pigmentation must then be absent; but it is possible to have a normal skin and albinotic eyes. Is it to be considered in such a case that the "arrest" is partial? Or, how can pre-natal arrest affect the hair, the pigmentation of which is largely developed after birth? We must admit at once "arrests" of latent characters. It seems useless to pursue the subject further, and it has only been dealt with at the present length, because albinism as an arrest of development is even referred to in modern treatises as if it were a suggestion of some importance.

We have considered the views of one historical school of writers on albinism, *i.e.* that which started with the idea of albinism as a disease, and after much rather fruitless discussion as to whether albinism was a *cachexia*² or not, evolved the theory of albinism as an arrest of development *in utero*. The second school attributed albinism to a defect in the parental germ, and in this broad principle its theory is more consonant with modern conceptions than that of the first school. But in detail its views are wholly untenable and its supporters the reverse of scientific. Its history may be briefly indicated here, for it is a remarkable one from the standpoint of the evolution of scientific ideas.

Herodotus (Bk. III., Thalia, CI.) speaking of the Indians says that they are of the same colour as the Aethiopians and adds :

¹ Cases of albinism of the skin only with normal hair and eyes ought to be frequent, but among whites, the only record we can find is the vague one of Phoebus (Bibl. No. 207).

² We suppose *cachexia* to signify a vitiated condition of some or all parts of the organism incompatible with good health. The curious reader will find ample information on this view starting from the writings of Blumenbach (Bibl. No. 101) onwards.

The semen that their males emit is not like that of other men, but black like their bodies, which is also the case with the Aethiopians.

Aristotle, *De Hist. Animalium*, Lib. III. Cap. xxii. says that the seed of all animals is white, and that Herodotus is not to be believed when he writes that that of the Aethiopian is of a black colour. It might be considered that a simple observation would have settled the problem, but discussion not observation was the method of the seventeenth and eighteenth centuries, and the works of Herodotus and Aristotle were then more familiar than natural phenomena to philosophers¹. But the idea of Herodotus was seized upon by the eighteenth century writers on albinism. The absence of pigmentation in the germinal fluid was the source of albinism.

Le Cat, 1765 (Bibl. No. 67), an author who for his day seems to have worked in a fairly scientific spirit, finds the origin of pigment in two constituents, (i) some volatile substance from the blood, "volatil du sang," and (ii) some nervous fluid, animal fluid or spirit, "suc nerveux." The combination of these two bodies formed an ink-like substance called by him *Aethiops* and by Pauw *Aethiops animal*. Thus Le Cat writes (p. 40):

La couleur des Nègres n'a pas une autre origine que cette encre, dont les houpes nerveuses cutanées, très poreuses, imbibent la surpeau qui les couvre.

The origin of pigmentation in the combination of two unpigmented substances,

¹ This is again well evidenced by the long series of writers on the eye from Aristotle to Plempius. This early ophthalmology is of some interest as indicating how far albinism was familiar to these early writers, and may be briefly alluded to here. Aristotle, *De Hist. Animalium*, Lib. I. Cap. x., classes eye-colour into μέλαν (*nigrum*), γλαυκόν (*caesium*), χαροπόν (*fulvum*), αἰγωπόν (*caprinum*). He states that the eye is most variable in man; all other animals except the horse have but one colour. He uses ἰδαρές (pale yellow) for sheep, and γλαυκόν for horses. A similar division is given in his *De Generatione Animalium*, Lib. v. Cap. i. Aristotle further regarded the γλαυκόν eye as being less lasting and more sensitive to light. Galen in his *Lib. Art. Med.*, Cap. 27, deals with the glaucous eye. He makes only three eye classes, *caesium*, *nigrum* and *medium*, but the latter which includes Aristotle's third and fourth classes he subdivides into many groups, *plumbei*, *virides*, *cinerei*, *crocei*, etc. In this group he also puts *sanguines*. This may refer to the albinotic eye; if so it is the only trace we have found in these early writers of an acquaintance with the albinotic eye. S. Portius (*De Coloribus Oculorum*, Florence, 1550) recognised the association of dark and light skin with dark and light eyes, and also the geographical separation of the two types. Portius is said to have realised that the blue eye denoted want of pigment; a cursory examination, however, only revealed the passage:

Qui igitur aquilonem versus inhabitant cum sint coloris albi, oculos quoque caesios habent; color enim caesius prope album est (p. 37),

which may be possibly taken to mean that blue is an absence of colour. V. F. Plempius (*Ophthalmographia*, 2nd Edn., 1648) refers to the long discussions on the number of eye-colours, citing numerous writers. In Liber iv. Problema lvii., p. 170, he discusses: "an caesii oculi noctu sint perspicaciores, interdiu bebetiores, nigri contrà?" He says that Aristotle and Averrhoes hold this to be so. Plempius himself asserts that "caesius oculus non potest interdiu esse acutissimo visu." Problema lvii. runs: "Cur nonnullorum oculi noctu sunt perspicaces, interdiu bebetiores." In all these cases the proof is ideological and not by recorded observation. We have not succeeded in finding any reference to albinism. Still the problems of these early ophthalmologists (the word applies accurately!) are closely allied to albinism, and we can conceive no more useful investigation to-day than an inquiry into the relative persistency and acuteness of vision of emmetropic light and dark eyes under varying conditions of illumination.

and the phenomenon of albinism arising from the congenital absence of one of them, is a theory which has something especially modern about it!

It needed but a step further and we find Pauw (Bibl. No. 72) placing the *Aethiops animal* in the germ cells. It is done in language strange to modern science, and accompanied by gross errors, but the fundamental idea is better than the language in which it is clothed:

La cause de la dégénération des Blafards, des Kackerlakes et des Dondos, réside dans la liqueur spermatique de leurs parents¹, en qui elle s'est corrompue et a perdu par une décomposition quelconque, cette substance noirâtre, qu'on a nommé *Aethiops animal* faute de pouvoir lui assigner un terme plus propre, ou un nom plus clair.

It will be seen that Pauw retrogresses on Le Cat, when he places the combination of the latter's two substances in the germinal fluid. But his reason for this lies in the fact that Le Cat himself had asserted that the colour of the seminal matter of negroes is blackish compared to that of white men. Further he was well acquainted with the passage in Herodotus, and dismisses Aristotle's denial with the remark that possibly the blackness did not appear to him so sensible as Herodotus suggests, or perhaps he had wanted the occasion of making an observation.

Comme le sperme des Nègres et des basanés est plus ou moins teint, plus ou moins noirâtre, il est par la même plus sujet à s'alterer que celui des autres hommes, en perdant sa couleur propre et naturelle ou en prenant une autre par la décomposition de la substance colorante qu'on nomme *Aethiops animal*, ou par la dissipation totale de cet *Aethiops*.

On the basis of this colour factor in the germinal fluid Pauw proceeds to account for the facts, as he knew them, of albinism in negro and white and the colour of human half-breds. The corruption or dissipation of the colour factor in the germinal matter was the source of albinism and not a pre-natal arrest of development. We can dismiss the Le Cat-Pauw theory as absurd, or interpret it, if we please, in the modern terminology of ferments and tyrosins, of determinants and latent colour factors. We may smile² when we read the dogmatic statement that "La couleur de

¹ Pauw believed that "la semence des deux sexes concourt également à l'ouvrage de la génération," and cites as evidence the colour facts as to mulattoes and other half-castes.

² We have made careful inquiries concerning any possible basis for the statements of Herodotus, Le Cat and Pauw. In the first place the seminal fluid of negro and native of India is not to the naked eye pigmented. A medical man in the Indian army who has had to deal with a case of spermatorrhoea testifies to the absence of pigmentation in the Indian. Another medical man with 18 years' practice in India stated at once that there was no pigmentation of the seminal fluid of East Indians. A third medical man examined the spermatozoa of Tamils with $\frac{1}{12}$ " Zeiss apochromatic and compensation oculars 4, 8, 12 and 18 and found no trace of pigment. A highly-trained medical man working in Nyassaland tells us that he had occasion to remove the semen from the vagina of a native woman, $\frac{1}{2}$ minute after coitus, and it was the same colour as a European's. Further microscopically examined he could detect no differences from the semen of a European, and the spermatozoa were not pigmented. He further gives the following bit of folklore from the same district: A small boy having a nocturnal emission goes in the morning to one of the old men and shows him the stain on his cloth. If it be dark, the boy will be unfertile. This might mean that in infrequent cases the seminal fluid really was dark, but is much more likely to be the humorous manner by which folklore expresses the universality of the white appearance. Clearly as Herodotus could have made only a naked eye observation and Le Cat little more, there appears

la matière séminale dans les Nègres n'est pas une hypothèse susceptible de doutes ou de contradictions; c'est une vérité de fait." But after all it was an advance to suggest even that pigmentation sprang from the combination of uncoloured substances, and further to realise that the absence of something in the germ cell involved the absence of one or both these substances.

If we accept the view that it is not the pigment itself, certainly not an *Aethiops animal*, which is carried by the germ cells, but some pigment controlling determinant; and that the absence of this determinant is the source of the "arrested development" (which may be far from being wholly pre-natal), we reach in a vague way some account of the appearance of albinism by the default of this determinant in one or both parental germs. Its perfect or imperfect impotence accounts for complete or partial albinism, and this impotence may be a racial feature of either parental stock or produced by some degenerating influence of the somatic on the germ cells of the individual parent. It would be unwise at present to assert that albinism always belongs to the stock, for although, as we shall see in the sequel, albinism is undoubtedly associated with certain stocks, we find long pedigrees traced through a number of lines, with the occurrence of only a single case of albinism. (See Figs. 99, 137, 393, 394, 501, 550, 559, 566, 577, 612, 639 and 646.)

Those who believe in sports and mutations, will possibly look upon these as typical cases, but if such sports are not atavistic, this is only another manner of saying that the somatic cells have in some way modified the normal germ cell of the parent.

If we thus associate albinism with the absence of a factor in the germ cell of the parent, we are still a long way from understanding how this absence affects the normal metabolism of the individual. Some light may be thrown on the point by a consideration of what is known as to the nature and origin of skin pigments in man. Anything like a full discussion would not only carry us beyond our limits but require a wider and more practical knowledge of chemical and pathological science than we possess. All that we shall attempt will be a sketch of some of the chief problems requiring solution, and we must refer those desirous of further information to von Fürth's important paper and full bibliography (1904, Bibl. No. 524) and to Meirowsky's monograph (1908). The subject naturally resolves itself into the following divisions: (i) the microscopic inquiries into the position and transfer of pigment, and (ii) the bio-chemical investigations as to the nature of melanin pigment.

These two divisions have been kept singularly distinct and have largely been developed by different groups of observers. In neither case can it be said that the members of the school have reached final and absolutely definite results, but much has been learnt, and even the negative knowledge gained is not without value as circumscribing the field of inquiry and suggesting more limited and special problems for further consideration.

therefore no basis for the dogmatism of Pauw. Indeed, from the modern standpoint, it could not be a question of pigmentation of the seminal fluid at all, unless this appearance were produced by pigment-bearing spermatozoa. Up to date there is no evidence of the germ cells carrying pigment.

We shall consider first the microscopic investigations and afterwards deal with the bio-chemical work which has run on during the same period.

A. *Microscopic Investigation into the Nature of Animal Pigmentation.* It must be at once admitted that there has been a long series of contradictory and somewhat inconclusive researches on this subject. Sweeping generalisations have been made as to the locus of origin of superficial pigment before an adequately wide basis in observation had been really provided. This locus has been widely asserted to be the endoderm; some have insisted that pigment starts in the ectoderm, while yet others consider the origin to be mesodermic. The most recent view is that it can arise independently in all these layers. The controversies round these opinions have been vigorous and considerably influenced the views of dermatologists as to the nature of leucoderma, albinism and other forms of leucosis. We can only briefly refer to the opinions of various writers here, and in so far as they are suggestive for the sources of albinism. Kölliker in 1860 discussed whether the epidermis is capable of autogenous pigmentation or draws pigment wholly from the cutis. He found in *Protopterus annecteus* pigment ramifications in the deeper part of the epidermis which proceeded from cells in the superficial layer of the cutis, these suggested structures migrating from cutis to epidermis¹. Such organs had been noticed by Sangiovanni as early as 1819 and termed by him *cromoforo*. They have received the name of chromatophores. G. Simon was the first to recognise them in the skin of mammals (1851), and then a whole series of investigators observed them in normal and pathological states (Addison's disease, etc.) in man, as well as in many other forms of life. Kerbert concluded from examination of the development of pigment in the embryos of reptiles, that the branched cells of the epidermis are migratory "Bindegewebzellen." Riehl dealing with hair supposed the migratory chromatophores to have ultimately originated in the neighbourhood of the blood-vessels.

Ehrmann, whose first important work dates from 1885, has in the course of twenty years considerably modified or expanded his views, which have been largely

¹ Histologie über Rhinocrypt. annecteus, *Würzburg. naturwiss. Zeitschrift*, Bd. I. S. 13, 1860. Much later Kölliker expressed himself in terms very similar to Ehrmann's (Ueber die Entstehung des Pigments in den Oberhautgebilden, *Zeitschrift für wissenschaftliche Zoologie*, Bd. XLV. S. 713—20, Leipzig, 1887).

His exact words are:

Was ich bis jetzt gefunden ist Folgendes: In den Haaren und in der Epidermis entsteht das Pigment dadurch, dass pigmentirte Bindegewebzellen, hier aus der Haarpapille und dem Haarbalge, dort aus der Lederhaut zwischen die weichen tiefsten Epidermiselemente einwachsen oder einwandern. Hier verästeln sich diesselben mit feinen, zum Theil sehr langen Ausläufern in den Spalträumen zwischen den Zellen und dringen zuletzt auch in das Innere dieser Elemente ein, welche dadurch ja wirklichen Pigmentzellen werden. Fast ohne Ausnahme liegen die pigmentirten Bindegewebzellen in den tieferen Lagen der Keim- oder Malpighi'schen Schicht und wenn ein Epidermisgebilde in seiner ganzen Länge oder Dicke gefärbt ist, so haben die äusseren Elemente ihren Farbstoff nicht *in loco* sondern zu der Zeit erhalten, wo sie noch der Lederhaut nahe lagen.

Kölliker examined, among a great variety of material, the skin of the negro and the darker pigmented areas of the Caucasian race, the nipple and areola, the scrotum and anus.

Hier zeigte die Lederhaut ohne Ausnahme, am reichlichsten in der Anusgegend, in der Nähe der Epidermis eine bald grössere, bald geringen Zahl von pigmentirten kleinen Bindegewebzellen. Ähnliche Zellen fanden sich auch, aber sehr unscheinbar in den tiefsten Lagen der Keimschicht der Epidermis....Das Pigment ist auch hier zum Theil inter- zum Theil intra-cellular.

accepted by dermatologists. In his last stage, the monograph of 1896, Ehrmann discards the name chromatophore; he considers that these cells not only carry the pigment, but produce it. They are accordingly *chromatoblasts*, or when we consider the form of pigment which occurs in mammals, *melanoblasts*. Meirowsky (*loc. cit.* ftn. p. 186), to whose excellent monograph we are much indebted, sums up in part Ehrmann's views as follows:

(1) The production of pigment occurs in special cells, the melanoblasts, which are not identical with mesodermal or epidermal cells.

(2) The melanoblasts are products of the middle germ layer, which in part develop further there, grow into the epidermis, and there have an independent cell existence.

(3) The material which is converted into melanotic pigment springs from the blood and is haemoglobin. Haemoglobin is converted into melanotic pigment by the vital processes of the melanoblasts.

(4) Extra-cellular creation of melanotic pigment is not yet demonstrated. True melanotic pigment only occurs in an extra-cellular form by the break-up of pigmented cells.

(5) The transfer of pigment occurs by aid of protoplasmic flow along protoplasmic threads, which connect the melanoblasts with the epithelial cells. For this reason this theory is not an *Einschleppungstheorie* but an *Einströmungstheorie*.

(6) Pigment is, at least shortly after its production, a body dissolved in a highly fluid colourless substance.

It will be seen at once that Ehrmann's views, if demonstrated, would have important bearing on the albinism of mammals. We have repeatedly drawn attention to the fact that albinos can possess a very large amount of diffused pigment. Is this or is it not melanotic? Is albinism to be looked upon as a universal or local absence of melanoblasts? Or is it due to the absence of a ferment necessary for the production of the melanotic pigment? Ehrmann in the case of albinism looks upon the absence of pigment in cutis and epidermis, the failure of pigment in choroid and retina, as an argument for a common origin of pigmentation, and asks why albinos do not occur which possess pigment in either epidermis or cutis alone. Considering the immense variety of types of albinism we have noted and have still to note, is it absolutely certain that such albinos do not occur? Ehrmann's views have been widely accepted by dermatologists. If correct, it is clear that the absence of melanoblasts and the absence of a ferment offer very different hypotheses for the explanation of albinotic states¹.

¹ Ehrmann (Bibl. No. 461, S. 45) writes as follows of albinism:

Der Albinismus bei Säugethieren ist ein universeller oder localer, aber vollständiger, Mangel an Melanoblasten. Bei Amphibien speciell aber bei Axolotl und Salamandra, die ja Pigmentthiere par excellence sind, fehlen die Melanoblasten nie vollständig, und ihr Albinismus ist auch ein unvollständiger. Am interessantesten ist wohl der zeitweise Albinismus des Grottenolms (*Proteus anguineus*) der nach kurzem Aufenthalt im Lichte dunkel wird, bei dem man sich überzeugen kann, dass die Melanoblasten im weissen Zustande zwar auch vorhanden jedoch wenig pigmentirt sind, und erst durch Belichtung zur Pigmentbildung angeregt werden.

If the view here expressed be correct, it would seem that in this case at least neither melanoblast nor ferment is sufficient to produce the pigment, a *tertium quid*, the action of light, is needful to set the process going!

Unna¹, who had much to do with spreading the views of Ehrmann among dermatologists, considered in 1889 that all observers were agreed that pigment did not originate in the epidermis, but was transported thither from the cutis; leucopathia of all types was not based on a recession of pigment from above, but on a cessation of supplies of newly-formed pigment from below. Unna's chief contribution to the subject is the suggestion that the pigment granules pass to the epithelium by means of the lymph stream.

Cohn², a pupil of Unna's, while accepting the view that pigment passes from the cutis into the epidermis, insisted on two other points: (i) that a whole series of different types of cells were capable of taking up pigment, and (ii) that free pigment certainly exists outside the cells. This latter statement, which is in accordance with one made by Kölliker, but seems opposed to Ehrmann's views, is of singular importance for its bearing on the "diffused" pigment of certain cases of incomplete albinism and associated states. Thus certain types of red hair, as well as certain flaxen and also mouse-coloured hair, appear when microscopically examined to have no granular pigment. The hair of native albinos is very frequently golden or red and again without granular pigment. The brown "spectacle marks" on our albino Pekinese spaniels contain no granular pigment, and the hair of the coloured dogs with albinotic eyes which have been born from these, also contains no granular pigment, only diffused pigment. We have found, however, that normal Pekinese with non-albinotic eyes but coat-colour identical with that of these albino dogs have also no granular pigmentation. It thus appears that the nature of this diffused pigment may be of crucial importance for the case of albinism³. It would be a possibly difficult but certainly a valuable investigation to ascertain whether or no it is melanotic in character. If it be, then the absence of a ferment is not the fundamental distinction between the albinotic and the non-albinotic.

Attempts have been made to test the *Einströmungstheorie* directly, and the most noteworthy of these appeared at first sight to be those of Karg⁴. He grafted a portion of a white man's skin on to a negro, and in ten weeks it had become as black as the normal negro skin. He continued this experiment further and grafted on to a negro, and then removed at intervals of four, eight and twelve weeks portions of white skin. According to his interpretation of his microscopic observations

¹ "Die Fortschritte der Haut-Anatomie in den letzten 5 Jahren," *Monatshefte für prakt. Dermatologie*, Bd. VIII. S. 79, 129, 210, 256, 366, Hamburg, 1889. Also *Selected Monographs on Dermatology*, New Sydenham Society, London, 1893, pp. 107—118.

² "Der augenblickliche Stand der Pigmentfrage," *Monatshefte für prakt. Dermatologie*, Bd. XVIII. S. 353—367, Hamburg, 1894.

³ The apparent intensity of this diffused pigment in the albino dog varies considerably. At times the coat appears quite white, but at other times it takes a marked yellowish tinge, precisely as the human albino's hair does. At the present time (July, 1910) the bitch Tong I, which has been running about on the open moor for three or four days, has developed almost a yellow head, the body remaining white. On the other hand the dog Wee Ling has not coloured under the same process.

⁴ "Studien über transplantierte Haut. I. Entwicklung u. Bedeutung des Hautpigments," *Archiv für Anatomie und Physiologie*, Jg. 1888, *Anat. Abtheil.*, S. 369—431, Leipzig, 1888.

there was a gradual penetration of pigment cells into the white skin. He later grafted a portion of the negro's skin onto a white man; it grew pale, and was removed and microscopically examined. Karg attributed this change to the passage of the *Bindegewebzellen* peculiar to the white man into the negro epidermis and the removal of the dead pigment by leucocytes, and considered that his microscopic observations supported this view.

Meanwhile a totally different interpretation was placed on the matter by Schwalbe in 1893¹, who asserted that on Karg's own showing it must have been fresh skin which grew and not the transplanted skin which changed colour. Schwalbe then developed his own view, which he based on the change of winter and summer coats in the stoat. He believes that he has demonstrated an autogen development of pigment in the epidermis—the activity of the protoplasm of the epithelial cells themselves can produce granular pigment without the aid of migratory pigment cells. He considered that the epithelial and dermal cells draw their pigment from the same source, but are wholly independent. He holds that (i) a pigmentation of the cutis can occur with completely unpigmented epidermis and hair, and (ii) a pure epithelial pigmentation can occur without trace of pigment in the underlying mesoderm². As an instance of the former, Schwalbe cites the volar side of the forearm of *Cercopithecus mena*, and of the latter the "Haaranlagen" of the skin on the back of the stoat³. Further, Schwalbe rejects the theory of the migratory "Bindegewebzellen" as pigment carriers; he considers the cells that have been proclaimed as such are merely transformed epithelial cells, and supports this by the consideration that they often occur in situations where no trace of pigment can be found in the underlying mesoderm.

Six years before Schwalbe, Retterer in 1887 had asserted that the pigment of the epidermis is autochthon and does not originate in the cutis, and a whole series of investigators, of whom the most noteworthy are Loeb, Jarisch and Post⁴, have taken this view or even asserted that the epidermis and not the cutis is the source of the pigmentation. Others have taken the probably more reasonable view that pigment cells can be independently developed in both epidermis and cutis.

A further portion of Ehrmann's theory, the origin of skin pigment in haemoglobin, has been criticised by Kaposi, who draws attention to the fact that the red blood corpuscles of albinos possess as large a content of haemoglobin as those of the normally pigmented; their mesodermal cells are just as active. Haematin is also transferred to them and yet the albinos' *rete* and choroid remain without pigment⁵.

¹ "Ueber den Farbenwechsel winterweissen Thiere," *Morphologische Arbeiten*, Bd. II. S. 1—606, Jena, 1893.

² The case of an ordinary white dog or horse suggests (i), and of the ordinary blue iris (ii).

³ Eine Betheiligung von Bindegewebzellen irgend welcher Art an der Pigmentirung des Epithels war in unserer Falle mit Sicherheit auszuschliessen, S. 576.

⁴ For a *résumé* of the views of these authors and references to their papers, see E. Meirowsky, *Ueber den Ursprung des melanotischen Pigments der Haut und des Auges*, Leipzig, 1908, S. 26—45. Also W. Garstang, *The Chromatophores of Animals*, *Science Progress*, Vol. IV. pp. 104—131, London, 1895.

⁵ "Ueber Pathogenese der Pigmentierungen und Entfärbungen der Haut," *Archiv für Dermatologie*, Bd. XXIII. SS. 191—205, 1891.

Kaposi concludes that the theory of the origin of all pigment processes in haemoglobin is untenable, and that other sources of pigment production than the red blood corpuscles exist. Jarisch and Rabl followed with experimental evidence that pigmentation arises in the ectoderm independently of processes in the mesoderm, and Loeb with transplantation experiments came to the very opposite conclusion to Karg, namely that the newly-formed epidermis pigment is not carried by the chromatophores from the cutis, but arises in the epidermis itself. Quite recently Wieting and Hamdi¹ have supported the view that pigmentation originates in the epidermis. They have considered among other matters the pigment of the eye, and are convinced that all pigment is exclusively produced in the retina, and that the choroid has no independent creation of pigment, but is dependent on the retina for its pigmentation². Pigment is brought to the sclera and the sheath of the optic nerve by way of the lymph passages. There is solely an epithelial production of pigment. More convincing evidence of the independent epithelial origin of pigment has been provided by Meirowsky, who has made use of the Finsen rays to produce pigmentation in excised portions of skin. The cutis was in these experiments free from pigment-bearing cells or they were extremely infrequent. The skin became after the application of the light either light brown or after two hours' exposure in certain favourable cases dark brown:

“Die Tatsache nun der energischen und schnellen Pigmentbildung bei vollkommenem Wegdrucke des Blutes und die Tatsache des gänzlichen Fehlens sogenannter Melanoblasten führten uns zu dem Schluss, dass die chemischen Strahlen das Pigment aus den Oberhautzellen selbst bilden, dass das Pigment also nicht in die Epidermis eingeschleppt ist und zu seiner Entstehung auch nicht des Blutfarbstoffes bedarf” (*loc. cit.* S. 48).

Further, Meirowsky experimented with the Finsen rays on scarred skin which both Ehrmann and Unna have held to be incapable of pigmentation. After excision and microscopic examination the cutis showed no sign of pigmentation, the epithelium throughout was very darkly pigmented. Neither in the cutis nor epidermis did Meirowsky find a single cell which could be called a chromatophore or melanoblast in Ehrmann's sense of the word (S. 49). From these and other results Meirowsky concludes that, as pigment can be formed in the epidermis independently of the existence of branched cells in either epidermis or cutis, the whole migratory theory and the melanoblast hypothesis collapse. Epidermis and cutis pigment can arise independently and the melanoblasts of one and the other are independent structures (S. 66—8).

Meirowsky on much the same grounds as Kaposi, *i.e.* the inexplicability of albinism and leucoderma on the haemoglobin theory, contests the view that the

¹ “Ueber die physiologische u. pathologische Melaninpigmentierung und dem epithelialen Ursprung der Melanoblastome,” *Zieglers Beiträge*, Bd. XLII. S. 23—84, 1907.

² Riecke (“Ueber Formen u. Entwicklung der Pigmentzellen der Choreoidea,” *Graefes Archiv für Ophthalmologie*, Bd. 37, S. 62—96, Berlin, 1891), and Meirowsky (*loc. cit.* S. 97) have both shown an independent production of pigment by the choroid.

pigment of the skin has anything to do with blood-pigments. The pigments of both epidermis and cutis are formed "autochthon in der Zelle selbst aus einem Eiweissmolekül einer färberisch wohl definierbaren Kernsubstanz" (*loc. cit.* S. 103). He concludes by accepting the view discussed later in this chapter that the origin of melanotic pigment arises from the inter-action of two enzymes, a tyrosinase and a ferment. In this way he would explain the pigmentation produced in his own experiments by the Finsen rays, *i.e.* by the breaking up of some albumen molecule followed by oxidation by an oxidase (S. 115).

But even if this theory be accepted its application to leucoderma and albinism becomes almost as difficult as on the haemoglobin theory. In the first place, to establish it, we ought to show initially that the Finsen rays will produce no pigmentation in either the leucodermatous or the albinotic skin. The peculiar feature, at least of albinism of the hair, is not so much the absence of superficial pigment—it may occur in a diffused condition—as the total absence or extreme paucity of *granular* pigment¹. Again in the case of leucoderma or partial albinism, are we to assume a *local* absence of the ferment? And if so, why is it that what is plentiful in closely adjacent parts of the system has no *access* to other parts? Why in leucoderma does the pigment, or shall we say the ferment, gradually retreat from certain areas? Again in complete albinos are we or are we not to admit the presence of melanotic pigmentation *internally*? Mr C. H. O'Donoghue, who had kindly examined albino rabbits, rats and mice for one of us, reported as follows:

I have found that the absence of pigment so noticeable in the external appearance of albinos does not seem to affect the internal organs. In examining the viscera of albino rabbits I found it impossible to discover any difference in colour that would enable them to be distinguished from those of normal animals. The spleen, liver, bile, kidney, adrenal body, Peyer's patches and salivary glands are to all appearances quite similarly coloured. Two rats and two mice, one of each pair being an albino and the other normal, gave similar results on examination and in addition the mesenteries of both normal and albino were alike in containing pigment cells whose presence was demonstrated by silver nitrate.

If the existence of melanotic pigment internally in albinos be confirmed, the superficial albinism cannot be due to the total absence of the ferment from their system. Again the appearance of diffused pigment in the hair of many albinos under favourable circumstances makes it even doubtful whether the ferment is really absent superficially. The possibility that leucoderma can be retrogressive³ as well as progressive suggests at least that the ferment can return, if it is not always *in situ*. It is very hard indeed to reach a satisfactory account of albinism and allied leucoses by local absence of a ferment. We are compelled in addition to suppose some physiological or structural change which either prevents access of the ferment, or perhaps, and more probably, hinders oxidation or storage of pigment if it be developed. Thus as far as albinism is concerned modern views on pigmentation do not seem to carry us beyond the necessity of assuming a structural differentiation of some sort. A great deal of experimental work on the albinotic skin—with the Finsen rays and in other

¹ The remarks of Cohn (see our page 185) should be noted here.

² See Karl Pearson, Note on Internal Albinism, *Biometrika*, Vol. VII. p. 240, 1910.

³ There are other temporary leucoses.

ways—naturally suggests itself. Indeed, suggestion of lines of further inquiry seems at present the chief result to be drawn by the student of albinism from the current theories as to pigmentation.

B. *Bio-Chemical Investigations as to the Nature of Animal Pigment.* We now turn more directly to those chemical investigations which have been carried on parallel with but largely independent of the microscopical work. The brief account¹ we can give naturally divides itself into the following problems: (i) What is the substance responsible for skin pigmentation? (ii) What is its source? (iii) What is its chemical nature? (iv) Is there a difference of kind or degree separating normal from pathological pigmentation?

(i) That the varying shades of skin colour are due to the presence, in greater or less amount, of a stable amorphous substance, melanin, is generally allowed; the only exception of importance being the group of cases in which there is a direct deposition in the skin of a pigmented substance, either following the prolonged exhibition of certain drugs, such as nitrate of silver, or the result of blood destruction in certain infectious and acute intoxications. The origin and nature of melanin are, however, by no means clear.

(ii) Most of the earlier workers were of opinion that melanin was a direct product of haemoglobin, the observations of Langhans being long thought demonstrative. Rosenstadt, however, showed that no identity had been established between the pigment formed from breaking-down red corpuscles and natural melanin.

The more recent and very elaborate studies of Ehrmann, who believed that melanin was derived from haemoglobin by the specific activity of mesoblastic cells, have also been criticised by Rosenstadt, Schmidt and others, the difficulty of satisfactorily identifying the breaking-down blood pigment with melanin being again emphasised. Kaposi² pointed to the absence of deeply pigmented dermal, subjacent to markedly coloured epidermal areas, and to the fact that local circulatory conditions in vitiligo are often normal. His remarks as to albinism have already been referred to on p. 186.

The evidence against the "haemoglobinogenous" theory is not indeed merely negative. Von Rosow observed skin pigmentation in artificially fertilised fish embryos, having completely colourless blood corpuscles, while similar observations on the transparent *Leptocephali*, although not quite concordant, tend in the same direction. A like remark applies to Rabl's work on poultry feathers, Fischer's on salamander larvae, and to the experimental transplantation of skin in guinea-pigs by Loeb. On the whole we are justified in saying that transformation of haemoglobin into melanin has never been proved, but that in the words of von Fürth:

Die metabolische aus farblosen Material erfolgende Bildung der physiologischen Pigmente bei Wirbeltieren in hohem Grade wahrscheinlich sei.

(iii) The chemical nature of melanin has been investigated by various workers. von Fürth reproduces in tabular form the results of several analyses. The elements

¹ We largely owe this account to the kindness of Dr M. Greenwood, Jnr.

² *Archiv für Dermatologie u. Syph.*, 1891, S. 191.

always present occur very approximately in the ratio $N:H:C::1:6:5\cdot7$. There are however many practical difficulties in the way of an exact analysis, and the above ratio is quite without precision. It seems that neither iron nor sulphur is constantly found¹ (Nencki and Siebers); the occasional presence of one or both these elements being possibly explicable on the hypothesis that the melanin molecule contains unsaturated atom-groups. Melanin is insoluble in water and alcohol, and hardly affected by boiling hydrochloric acid (Berdez and Nencki). Melanotic sarcomata, when heated with concentrated sulphuric acid, lose their colouring matter which is reprecipitated by water. Melanins of different origin react differently with alkalis. Spiegler obtained from hairs, by two processes, colourless substances—pigment acids which dissolved in ammonia with the formation of a black solution. Indol has been shown to be a very constant end product in the analysis of melanin, but the exact molecular structure of the latter is still uncertain.

More recently² von Fürth and Jerusalem have studied *Hippomelanin*, a pigment obtained from melanotic tumours of the lymph glands of the horse. They give (S. 170) the following constitution, remarking, however, that the substances obtained cannot claim chemical purity and unity:

	C %	H %	N %	S %	O %	Atomic Constitution
Hippomelanin	54.60	3.87	10.67	2.84	28.02	$C_{69} H_{51} N_1 O_{23}$
Artificial Melanin	55.77	4.16	7.62	—	35.45	$C_{82} H_{77} N_1 O_{41}$

They consider their investigations to show that with increasing oxidation the relation of C to N increases, and approaches the relation of artificial melanin, or of tyrosin. They suggest that the "nucleus" of the probably very great hippomelanin molecule is similar to that of artificial melanin, and that this nucleus becomes more apparent as the accessory groups are removed by chemical treatment. As a conclusion from their experiments on hippomelanin they consider that no facts have come to light irreconcilable with the hypothesis of a fermentative origin for natural melanin. They add, however, that they do not consider tyrosin as exclusively the mother-substance of natural pigments ("sondern auch andere im Stoffwechsel auftretende zyklische Komplexe dabei in Betracht ziehen möchten," S. 171).

(iv) The most striking examples of pathological coloration are the peculiar disease first studied by Addison and the melanosarcomata. Virchow, to whom we owe the first scientific investigation of pigment tumours, denied that their colouring matter was a result of blood extravasations and suggested that we have to deal with a not merely local condition, but a general vice of metabolism, a *dyscrasia*. Subsequently Langhans upheld the view that blood extravasations were responsible for

¹ Sachs, 1812, the albino scientist made a chemical analysis of his own hair (Bibl. No. 151) and found it relatively wanting in iron, but the observation needs repeating by modern methods.

² "Zur Kenntnis der melanotischen Pigmente und der fermentativen Melaninbildung," *Hofmeisters Zeitschrift für die gesamte Biochemie*, Bd. x. S. 131—173; Braunschweig, 1907.

the pigment, and this theory, or rather modifications of it, were supported by many workers. On the other hand Baumgarten, Fuchs, Birch-Hirschfeld, Ribbert and others have advanced very powerful arguments against such views. Fuchs justly remarked that were blood-colouring matters soaked through the cellular tissues equally, we should not find, as we do, isolated groups of deeply pigmented cells surrounded by unpigmented ones. Further, he pointed out that the pigment derived from the blood corpuscles passes through various colour changes, whereas melanin even in young cells is always black¹. Ribbert brings weighty evidence in support of his belief that melanosarcomatous cells are quite specific, and that the pigment is a product of their metabolism². Gouin, who applied various tests for blood pigment in a case of melanosarcoma of the cornea, remarks:

Ou bien que des éléments mélaniques peuvent prendre naissance au sein même du tissu de la cornée. Ou bien que du faux pigment hémorragique peut acquérir tous les caractères mélaniques sans qu'il soit possible de l'en distinguer par les moyens usuels³.

A certain number of observers have taken up a position intermediate between the two schools. For instance, Oppenheimer and Jooss hold that a proteid combined with haematin in the haemoglobin molecule, is the precursor of melanin; but their arguments are not entirely convincing. Just as in the case of normal pigmentation the weight of evidence favours the view that sarcomatous melanosis is a resultant of specific cellular activity, not a direct transformation of a pre-existing body pigment. It may also be remarked that no satisfactory evidence has yet been produced that there exists any difference in kind separating the melanin of normal pigmentation from that found in melanosarcomatous cells.

Although Addison's disease has led to much discussion and a considerable literature, yet our knowledge of it is still far from complete. Even the identity of Addisonian pigment with normal melanin has not been satisfactorily established, although, perhaps, the weight of evidence is in favour of such a conclusion (Virchow, von Recklinghausen, Overbeck, and especially von Kahliden). Von Kahliden in an interesting paper points out the close analogy existing between Addisonian pigmentation and that of normal dark or brown races⁴, and more recent work does not appear to have invalidated his results. Although we are still much in the dark as to the true pathology of Addison's disease, there is strong reason to believe that it is due to a state of abnormal metabolism and not to some purely local cause.

Supposing this to be true, an interesting possibility suggests itself. May it not be that such conditions as Addison's disease, in which there is an abnormal production of skin pigment, are connected with states of abnormally weak pigmentation like albinism, in that in one a form of metabolism is abnormally active, in the other

¹ The colour changes in blood extravasations have been elaborately studied by Dürch, *Virchows Archiv*, 1892, Bd. cxxx. S. 29 et seq.

² "Ueber das Melanosarkom," *Zieglers Beiträge*, 1897, S. 471—99.

³ "Un cas de Sarcome pigmenté de la Cornée." *Ibid.*, 1898, S. 596.

⁴ *Virchows Archiv*, Bd. cxiv. S. 65—113, see especially S. 98—100.

morbidly inactive? Were this so, an increased knowledge of Addison's disease might throw some light on the albinotic state. Of course this is at present a pure speculation, not, however, wholly inconsistent with what is already certain¹.

The relation of melanin to tissue change has some importance for albinotic studies, and a few notes on this point may be of interest.

Many observers (Eiselt, Lerch, Finkler, Katsurada, etc.) have found in cases of melanosarcoma, melanin or a substance yielding melanin in the urine. This appearance seemed to be associated in a few cases (Ganghofner and Przibram) with retrogressive changes in the skin tumours. The exact significance of the phenomenon is not, however, clear.

Paul Carnot, 1896 (Bibl. No. 460, S. 1009) studied by means of experimental injections the method of pigment excretion in normal animals. He employed (i) choroidal pigment diluted with aqueous humour, (ii) melanin pigment from melanotic tumours in the horse, (iii) cuttlefish ink dissolved in salt water. The methods employed were intravenous, intraperitoneal and subcutaneous injections. By intravenous injection it appeared that most of the pigment was fixed by the liver, spleen and lungs; and eliminated by the kidneys and intestinal epithelium. By subcutaneous and intraperitoneal injections in addition to the above localisation, special localisations were observed in the suprarenals and great omentum. For example a dog received 40 c.c. extract of horse melanin; after four days the suprarenal capsule was completely black. On examination the distribution of the pigment in the latter varied. There were zones of complete pigmentation and total absence of cellular elements, mixed zones, and zones where the pigment was intracellular and apparently undergoing decolorisation and destruction. In another case pigmentation fixation was well marked in the great omentum. There was no skin pigmentation.

L'injection intraveineuse détermine une fixation probablement d'ordre mécanique au niveau du foie, de la rate, du poumon. L'élimination se fait par le rein (glomérules) et l'intestin. Enfin les capsules surrénales et probablement les organes lymphoïdes paraissent fixer et même décolorer et détruire les granules pigmentaires.

Robert ("Ueber Melanine," *Wiener Klinik*, Bd. xxvii. 1901, Heft 4) injected rabbits and guinea-pigs intravenously and subcutaneously with alkaline solution of tumour and sepia melanin and found elimination by means of the urine. He was led to the conclusion that all the injected pigment was eliminated in this way, and as a matter of fact two animals killed a few days after the injection showed no trace of pigment except a little at the site of inoculation. Some of the rabbits he used were albinos, and at the beginning of his experiments he held the view that the melanin would tend to cure or ameliorate the albinism.

Ich zweifelte nicht dass nach der intravenösen Einspritzung die albinotische Iris binnen zehn Minuten sich dunkel färben und vielleicht das Pigment lange Zeit behalten würde. In dieser Hoffnung habe ich mich gründlich getäuscht, denn es trat überhaupt keine merkliche Dunkelfärbung irgendwo im Auge auf. Ja selbst subkonjunktivale Einspritzung des tierschwarzen Lösungen führte keine Farbenveränderung des Auges herbei. Die Erklärung ist aber darin zu suchen, dass das im Blut kreisende Melanin von den

¹ Levi (Bibl. No. 319) has reported partial leucoses accompanying the gain of pigment in 12 cases of Addison's disease: see ftn. 3, p. 200.

sauerstoffarmen Organen des Kaninchens, also wohl hauptsächlich von der Leber sehr leicht reduziert und dadurch zu rasch entfärbt als dass es zu einer Ablagerung in den Pigmentzellen des Auges kommen könnte.

Both Carnot's and Kobert's experiments seem to indicate that the mere presence of a melanin is not sufficient to produce a deposit of pigment in the pigment cells; they again suggest that in albinism we have to do with a special type of metabolism.

A series of not very conclusive experiments by Bidder (Bibl. No. 383, p. 897, 1882) were undertaken to produce artificial albinism, thus reversing the procedure of Kobert. Rabbits were injected with 33 $\frac{1}{3}$ per cent. potassium chloride solution. After some superficial abscess formation, they subsequently developed patches of white hair at the sites of inoculation. The process appeared very dangerous, in one case causing instant death. The author suggests as explanation:

Dass möglicher Weise durch den oxydisenden Einfluss des bei der Injection in das Cutisgewebe extravasirten Blutes das Chlor aus dem Salz frei wird und nun das Pigment des benachbarten Rete Malpighii entfärbt resp. zerstört.

It is not clear how far the result was a sequel of the abscess, nor to what extent the partial albinism was permanent.

We may conclude this discussion with some remarks on the artificial formation of melanin and the light it seems to throw on natural processes. Schmiedeberg obtained from proteids, by the prolonged action of mineral acids, a substance having properties similar to those of natural melanin, and yielding indol and skatol when heated with potash. The substances isolated by Gmelin from the products of pancreatic digestion were of a similar nature. Further the atomic ratios in natural and artificial melanin agree fairly well (Hofmeister). Von Fürth obtained a melanin-like body by acting on proteid with nitric acid, and Ducceschi prepared the same substance from tyrosin and sodium nitrate. Samuely concluded that the proteid molecule must contain several atom groups yielding skatol, pyrol, tyrosin and pyridin, and that any one of these groups might originate colouring matters resembling melanin. Hopkins and Cole have succeeded in isolating a crystalline substance, tryptophan, as a product of pancreatic proteid digestion which may be the mother substance of these "proteino-chromes."

For the production of artificial melanin from proteid oxidising processes are of importance. Researches on natural melanin support the view that the same processes are important for its production. Bertrand showed that certain plants contained a ferment, tyrosinase, which could oxidise tyrosin with the production of a dark coloured substance. Von Fürth and Schneider prepared a similar ferment from the body fluid of lepidopterous pupae, which, when added to an aqueous solution of tyrosin, precipitated dark flakes of a substance resembling melanin in physical characters and percentage composition. A tyrosinase has also been found in the ink sac of *Sepia* (Przibram and Gessard), in melanotic tumours (Gessard), in fly larvae (Dewitz), in the blood of *Bombyx mori* (Ducceschi). Quite recently tyrosinases have been found in the skins of new-born rabbits, rats and guinea-pigs by

Florence M. Durham (Bibl. No. 522), but their presence or absence in the skins of albinos does not seem to have been determined.

The general conclusion to be drawn from these results is that natural pigmentation is intimately associated with the presence of some such ferment as tyrosinase, but the series of chemical reactions involved appear to be in need of much further investigation. We have given the above results chiefly based on von Fürth's summary with hesitation, and must caution the reader that they merely touch the fringe of a wide subject. But their bearing is so all-important for the discussion of albinism, and especially for the inheritance of the albinotic character, that it appeared impossible to avoid these problems entirely.

We may sum up their bearing on albinism as follows :

- (i) The presence of melanin is responsible for skin pigmentation.
- (ii) Melanin does not appear to be a direct product of haemoglobin.
- (iii) The supply of a pigment by way of the blood or otherwise has not hitherto been successful in increasing existing pigmentation or producing it where it was absent.
- (iv) It seems probable that pigment is created and stored *in situ*, and is due to a metabolic process not yet fully understood.
- (v) The possibility of abnormal absence and abnormal presence of pigmentation being extremes of one normal metabolic process is, perhaps, worthy of consideration.
- (vi) The production of pigment is very probably due to the local action of a tyrosinase or ferment on tyrosin.
- (vii) It has been suggested that the cause of albinism is the absence of the ferment¹.

If this were demonstrated it would be a distinct advance and carry us further back in the analysis of the defective metabolism of albinism. It must, however, be remembered (i) that the absence of the ferment in the albino must correspond to some abnormality in the zygote, and ultimately to some defect in one or both gametes. This defect can hardly be an absence of ferment. (ii) The materials for development are supplied *in utero* by the mother who may be (a) herself pigmented and (b) produce at the same time pigmented and unpigmented twins. It would appear that she is thus able to provide the ferment for one and not for the other offspring. The suggestion, which we would make for the consideration of the physiologist, is that the ultimate difference between the normally pigmented individual and the albino will be found after all to be one of *structure*. It is easier to grasp the influence of a difference of gametic constitution on structure than on chemical process. The failure of the normal metabolic process is due, we suggest, to differentiated structure in the albino. If there be local absence of ferment, it may possibly be that the structure does not permit of its reaching its destination. If it should turn out to be there, it is possible that the failure may lie in the cellular

¹ Thus Miss Durham writes (Bibl. No. 522): "Hitherto, material from white or albino animals has yielded no results, but the animals obtained were too few for final conclusions to be formed in regard to them."

structure, which is such that pigment cannot be stored in the normal manner, even if produced¹.

Now although this suggestion is merely tentative there are recorded facts about albinism which are not at all out of keeping with such an hypothesis². In the first place we may again note that the process of oxidisation appears to produce diffused pigment in the hair of albinos, giving the tip of the hair, and often much more a yellow and occasionally almost red appearance. The pigment cells are sometimes present, but appear to have little or no pigment in them (see our Chapter *On the Albinotic Hair*). Again if structure were identical, it is difficult to understand how in cases of partial albinism, the ferment should be confined to some portions of the skin, and be wanting in others. Indeed when we come to note the varying grades of skin pigmentation in native albinos, the graduation of structure seems a very reasonable view. It will be remembered that Buzzi (see p. 167) denied the existence of the *rete mucosum* in the skin of his albino woman. It is probable that it existed in a defective state. Wharton Jones (Bibl. No. 202) found it in the skin of an albino, but in a rudimentary condition. The frequent skin troubles of albinos perhaps point to difficulties in excess of what we might anticipate from mere absence of pigment. Finally we may quote the very definite view of Manz after a dissection of the albinotic eye, and a consideration of all the evidence available (Bibl. No. 357):

If at the present time, we take all the facts into consideration, we shall arrive at the conclusion that not the absence of pigment as such, but the condition of the structures remaining pigmentless, their texture in the widest sense, is the essential pathological characteristic of albinism.

¹ Kobert's experiments may from this standpoint be of great importance, see p. 192. Carnot's might merely show that the pigment cells were charged to their full capacity.

² An adverse criticism of Blumenbach's view of albinism has been frequently made because in his *De oculis Leucaethiopum...* (Bibl. No. 101, p. 11) he asserts that the rose colour of the albinotic eye follows from the albino's *skin* disease. The title of this section of his memoir is: *Roseus oculorum color non nisi symptoma est singularis morbi cutanei* (pp. 11—19), and we fancy that most of the critics have not got beyond the title, and assumed that Blumenbach held that some form of disease produced the rose hue of the eyes. As a matter of fact Blumenbach attributes the rose colour to the absence of pigment, and this absence of pigment is a symptom he thinks of defective membrane structure. Blumenbach shows in a broad way, quoting Aristotle and Portius and general experience (see our p. 180 fn.), that there is a relationship between eye and skin colours both as to intensity and tint. He then indicates that this relationship between eye and skin arises from a general likeness in the tissues of both. He holds that the choroid and uvea and other tissues which he speaks of as the internal membranes of the eye were in structure like the "rete malpighianum," and that when this failed to perform its function, the storing or development of pigment, the others also failed. He thus attributes albinotic eye and skin to a common source, a defect, which he calls a disease, of the pigment tissues. We think we may look upon Blumenbach as a protagonist of the view that albinism is primarily a failure in structure, i.e. it is in his language a *morbus cutis* before it is an absence of pigment.

The correlation of hair, eye and skin colours is probably not so complete as Blumenbach and other early writers believed (see *Biometrika*, Vol. III. p. 459), who had probably not recognised the existence of a black-haired, blue-eyed type or race. On the other hand the intimate association of eye and skin is often markedly illustrated in special cases, e.g. that of Regina Jordan quoted by Ernst in 1830 (Bibl. No. 193, S. 40), who, he asserts, had from birth not only a parti-coloured iris, but a parti-coloured skin.

Manz reached this view from a very different standpoint to ours. He appears to look on albinism as a pathological product, and heredity as at any rate a very minor factor. We throw out the suggestion as hypothesis, not as conclusion, that albinism is an hereditary defect of structure, and possibly only of superficial tissue structure, which interferes with the normal metabolic process by which pigment is produced and stored. The absence of pigment is a secondary result of the albinotic structure, and not the primary source of the albinotic constitution. The delicacy and thinness of the albinotic tissues, their resulting increased vulnerability, and diminished resistance to thermal, luminous and mechanical influences are not solely due to absence of pigment; it is suggested that they mark a differentiated tissue structure on which the absence of pigment itself depends. There are many ways by which this hypothesis can be tested, and such tests will be fruitful even if the hypothesis has to be discarded. In considering the facts recorded in the following chapter, on the various forms of albinism, partial and incomplete, the theories and hypotheses of this chapter will we think be of service to the reader, although all purely theoretical discussion will there be omitted.

If we take the view that albinism is not a disease, nor an arrest of development, but its chief, if not sole source is the inheritance of an abnormal tissue structure, we shall be able not only to class it with other forms of inheritance of abnormal structure, but to test our hypothesis by ascertaining whether its inheritance follows the same laws.

NOTES ON CHAPTER IV.

The Albino Roche, pp. 169, 176. The *Musée des familles*, T. III. p. 81, Paris, 1836, gives a picture,—almost the earliest of a European albino,—of this “lapin blanc,” and terms him the “crétin albinos de Bicêtre,” thus giving wider currency to the Tröxler theory of a link between albinism and cretinism.

Deaf-Mutism and Albinism, p. 176. We have omitted to mention that Wilhelmi only examined the statistics of 578 deaf-mutes. Clearly albinism might well be twenty to thirty times as frequent among deaf-mutes as among the normal population without the absence of an albino exciting any surprise. There was no investigation of the fundus of these deaf-mutes, but only an examination of census schedules filled in by laymen.

CHAPTER V.

LEUCODERMA.

IN the previous chapter we have shown some reason for the view that the ultimate source of albinism may really be a structural defect, which does not allow of the normal storage or development of pigment. Gradations of this structural defect would account for the wide range of incompletely albinotic types we have learnt to know in our account of the albinos of native races, and in the eyes of European albinos. It seems, further, the only explanation which will embrace under a common conception complete albinism, incomplete albinism and partial albinism. The phenomenon of piebaldism is consistent with a structural difference between different parts of the epidermis; and any conception of a spotting or piebald factor is purely a metaphysical, or rather metaphysiological, conception, which ultimately must reduce itself to a question of why certain portions of the skin physiologically admit of pigment and others do not. From this standpoint all grades of pigmentation, all changes of pigmentation, and all local absences of pigmentation are of peculiar interest to the student of albinism. Above all, it is important to indicate any links which may occur between these classes of phenomena. The misfortune at present is that so little is known physiologically about skin structure in cases where pigmentation fails. Did we know more about senile leucosis, about leucoderma, or about piebalds, we should probably know far more about albinism itself. We propose in this chapter to consider some points as to leucoderma in their special relation to albinism.

Leucoderma. The exact definition and limitation of leucoderma seem somewhat unsettled even at the present time, and probably a number of diverse states have in the past been classed under this name or that of vitiligo¹. We may dismiss at once as falling outside our subject that class which has a parasitic origin² and to which some of the earlier reported cases may possibly have belonged. A typical case of this kind is the *pinta* of tropical America, where the spots are directly attributed to a fungoid growth³. It is well known that after a wound, burning or injury of some kind the injured skin may lose its pigment, and this is markedly the case in the negro. A curious instance of this occurs in the circumcised negro. In the uncircumcised negro the *glans* is unpigmented and red; in the circumcised negro

¹ Hutchinson in 1863 said that *leucoderma* "differs essentially from *vitiligo*, properly so called, in that there is no thickening whatever of the skin on the affected patches." *Lond. Hosp. Clinical Lectures*, Vol. I. p. 7, London, 1864.

² *Archives de Parasitologie*, II. 1, p. 153, 1898. See also Neveu Lemaire, Bibl. No. 490, p. 191.

³ See Scheube, *Diseases of Warm Countries* (trans. Cantlie), 1903, p. 532.

the wound loses its pigment¹, but the glans being exposed rapidly gains pigment and becomes black². In the early cases of negroes "going white," to be reported below, there often occur references to injuries of some kind as the source of their progressive leucosis. Hervieux³, in a fairly early paper on partial leucopathia or "albinisme local accidentel," invokes Rayer⁴ in favour of the belief that the condition often results from mental shock (*commotions morales*). But there are so many cases without any history of injury or shock⁵ that such can hardly be an essential feature of leucoderma. According to some writers (Hervieux⁶, Bärensprung⁷, etc.) the loss of pigment is accompanied by neuralgic or other pain, and there is inflammation of the affected areas. On the other hand, a number of authors cite cases in which the change goes on without the least discomfort of any kind. Hutchinson very early (1860) noted that leucoderma was consistent with good health. Of nine cases, four males were in good health, one rather delicate, and one youth had remarkably retarded development; one female had uterine disease, another ovarian tumour and a third died of renal disease (*loc. cit.* p. 17). Again, Hansen, 1869⁸, writes about a characteristic case in a European boy: "All these patches arose without irritation (*Jucken*) or pain, often unnoted by the boy and his parents. The parts affected were never hot [so described by some earlier writers] and they did not scale off. During the whole origin and progress of the affection the general health was not in the least disturbed."

This agrees extremely well with the account given by two sufferers to one of our own number. In the first not the slightest heat, pain or discomfort of any kind was exhibited by the affected parts. Discomfort only arose after an area was entirely deprived of pigment, in which case, when exposed to the sun in outdoor summer work even in England, it did not tan, but blistered and cracked,—precisely as occurs in the case of albinos⁹. In the other instance¹⁰ the leucoderma came on after a visit

¹ Dr G. A. Turner refers to the ring of pure white skin at the back of the glans as a result of circumcision wounds, and it must be carefully distinguished from partial albinism of the penis: see our Chapter on *Partial Albinism*.

² See the statement of Dr Henry Strachan on our p. 123.

³ See Bibl. No. 242 (name wrongly given in the Bibliography).

⁴ See Bibl. No. 179, T. II. p. 563.

⁵ We do not wholly dismiss "shock" as a possible initial source, but only wish to indicate that neither shock nor sudden illness seems essential. Thus in only one of the cases known to us has there been shock. In this case, which has recently come to our knowledge, the sufferer attributes the onset of the leucoderma to the great nerve shock experienced in the Jamaican earthquake of 1907.

⁶ *loc. cit.*, insomnia, severe abdominal and testicular pain.

⁷ "Schleichende Entzündung der Haut" and loss of hair over the parts affected (see Bibl. No. 257, S. 16). This type of "vitiligo" with loss of hair seems akin to what used to be termed Bateman's vitiligo, and is possibly a form of urticaria which should be differentiated from leucoderma.

⁸ See Bibl. No. 319 with a good photograph of leucoderma.

⁹ Account of III. 11 in our Figure 551. Hutchinson (*Lectures on Clinical Surgery*, Vol. I. p. 38, 1879), says "that in hot climates, the blanching of leucoderma is of real detriment to the patient. In our own climate it subjects him to no inconvenience." That this is not always true is proved by the above case, and by some other cases where field work was followed.

¹⁰ Letter to K. Pearson dated 20/11/08.

to the tropics but without any special shock; it remains dormant in England but spreads further on occasional tropical visits, the areas growing larger and fresh ones appearing; the hair originally dark brown has become white nearly all over the body. There has been no inflammation and the affected has "never felt the slightest inconvenience or pain at any time." Both these cases are those of persons with extremely nervous temperaments. It was formerly supposed that leucoderma only came on in adult life¹, but Greenwood cites the case of a Cree baby of one to two years (see our account below). Hutchinson gives the cases of a boy of twelve in whom it started at four, and of a lad of 19 who had some patches in infancy, and whose mother thought he was born with some²; further Hansen³ and Flatau⁴ also instance cases of children⁵. The possibility in leucoderma of very early development followed by a stationary condition, and the fact that babies only gradually develop skin pigment, so that congenital unpigmented areas might not be at once noticed, render it not so easy to distinguish partial albinism from stationary leucoderma in young European children⁶. A good deal of stress has been laid by some dermatologists on the concentration of pigment at the margins of the leucotic areas. It is by no means certain that this is not due to "simultaneous contrast," and it is certainly not a marked feature in all cases.

Crocker defines leucoderma as: "an acquired disease, characterised by the presence of symmetrical and progressive white patches with convex borders surrounded by increased pigmentation⁷." He considers that it is most common in neurotic subjects and that it comes on after severe suffering, from cold, or sunstroke. To distinguish it from partial albinism Crocker notes that: "Its symmetry, progressiveness, and the combination of excess and deficiency, are characteristic features; in all these points it differs from the congenital white patches which are sometimes to be observed, and called partial albinism⁸." There seems little doubt, however, that leucoderma ceases in some cases to be progressive⁹, and that in such cases the increased pigmentation at the borders and the progressiveness are alike wanting as characteristic features. Further, the symmetry may be by no means marked, and the distribution of patches in undoubtedly congenital cases

¹ See Bibl. No. 33, p. 179.

² *New Sydenham Society Atlas*, Plate X and *London Hospital Reports*, Vol. i. pp. 7—15.

³ See Bibl. No. 319.

⁴ See Bibl. No. 445.

⁵ We have noted also another case "in childhood" and a further case in a child of three years.

⁶ Bärensprung (see Bibl. No. 257, S. 5) writes: "Die Haut des neugeborenen Kindes hat überhaupt kein Pigment, und daher kann sich ein partieller Pigmentmangel erst später markiren, wenn die übrige Haut eine dunklere Färbung annimmt." He appears to consider, citing Mansfeld's communications, that complete albinism will on this account not be noticed at birth, but only recognised later when the skin retains the delicate white of earliest youth. But a baby is not born delicate white and as soon as its eyes open the distinction between the blue eye of the normal baby and the pink eye of the albino can be at once recognised. In albino puppies the red reflex is noticeable practically on the day the eyes open.

⁷ See Bibl. No. 499, p. 625.

⁸ *Loc. cit.* p. 624.

⁹ Hutchinson noticed (Cases VII. and VIII.) the cases of a woman, aged 45, where the leucotic patches had "been so for years," and of a man aged 60 where they had been so for many years (*Clinical Lectures and Reports*, *London Hospital*, Vol. i. pp. 14—18, 1864).

does not always differ widely from that occurring in acquired but stationary leucosis. In fact, until far more is known of the structural state of the skin in both congenital partial albinism and leucoderma¹ it would be rash to affirm or deny any physiological difference between the unpigmented areas in the two cases. It is conceivable that in leucoderma we see the structure characteristic of albinism in the making. Crocker held that pigmentation in leucoderma could not be recovered, although by the wider spread of the patches the contrast may become less marked; this he considered to be the source of reported cures². He cites, however, Noëcke as stating that in his own case it began at five and that at one point pigment was restored³. Evidence in favour of a recovery of pigmentation has been recently given in a negro case of leucoderma. Attention was first drawn to this case by Hugo Niemeyer⁴ and it has been followed up till death by Dr Reinhard⁵. The Kaffir, William Sechele, was about 40 years of age, when Niemeyer saw him in the presence of the missionary, Pastor Sack, at the mission-station at Pretoria. He was extremely intelligent and belonged to a Kaffir race, the Knobuluze, who lived in the north of the Transvaal until they were scattered by the Zulus. His parents were healthy and also his siblings, who as children showed no anomalous pigmentation. He

¹ "Lesser had the opportunity of examining an area of partial albinism from the abdomen of a girl who died of phthisis and found the skin absolutely normal except for the absence of pigment" (see Bibl. No. 457, p. 1181). G. Simon made a microscopic study of the skin of a European woman who died in a hospital at Berlin, and whose skin presented at several parts white patches; the dermis and epidermis had a normal structure, only in the depigmented regions, the cells of the *rete mucosum* of Malpighi were totally deprived of the granular pigment which elsewhere filled them (see Bibl. No. 415. Is this really Lesser's Case?). Notwithstanding these very definite statements, it seems, especially in view of the results of Manz (see Bibl. No. 357), extremely unlikely that this absence of pigment is not really accompanied by some difference of structure in the cells, tissue or nerve system.

² There is also a much more marked contrast between the normal skin and leucotic patches when the normal skin is tanned by exposure in the summer.

³ *Loc. cit.* p. 626. Erasmus Wilson (*Portraits of Diseases of the Skin*, London, 1855) gives a case of "Leucopathia or Partial Albinism" in a professional man. There is the original coloured drawing of right side—the chromolithograph reverses—in the Royal College of Surgeons Museum, Dermatology, Case 18, 136—7. It shows nipple and large area of skin external to it much pigmented in irregular distribution. The opposite nipple bleached. Three areas of leucosis, (a) on front of shoulder, (b) over posterior Δ of neck, (c) between front of sternomastoid and trachea—all on same side as redundant pigmentation. The lithograph is not a very accurate copy of the drawing. In the description given in the work cited above (Plate H) there is obviously some confusion owing to the lithographic reversal. The leucosis began at age 17 on tips of fingers, seven years before record of case, and it is stated that some of the leucotic patches resumed their normal colour, while the general skin was said to have been growing darker for several years. There is little doubt, however, that this was not a case of simple leucoderma, but of Addison's disease with associated leucotic patches (see our p. 192, *fn.*). This was later recognised by Erasmus Wilson himself, *Lectures on Dermatology*, London, 1878, p. 17, where, after stating that the subject died soon after the lithograph was published, he adds: "We may therefore conclude that he was at that time affected with obscure organic disease—possibly that form of disease afterwards described by Addison."

⁴ "Ein Fall von periodischen Pigmentwechsel bei einem Kaffir," *Monatshefte für praktische Dermatologie*, Bd. XII., S. 100—2, Hamburg, 1891.

⁵ Bibl. No. 472.

himself had a normal deep brown skin till 17. Then appeared on one place on his back, which formerly had short, woolly, black hair, a small white spot which gradually increased and finally covered the whole back. It then affected the entire trunk and limbs until, finally, the whole body was of a white colour. At the same time a white spot appeared on the left ear, which increased and spread irregularly over face and neck so that islands of the original brown-black skin remained and gave the face a spotted appearance. But this pigmentation changed so that what was first white became black and then turned white again. Isolated small black spots on the forehead would increase in size, and finally swallow up the white, or the white spots now situated in the black would gradually spread. Thus the colour of face and neck was continually changing. The patient could give no definite account of the time a particular place took to change from white to black again, it was between three and twelve months. His only complaint was that the skin of his face was very sensitive to the sun. He declined to strip, so that Niemeyer only saw face, neck, forearms, hands and lower part of legs. Pastor Sack confirmed the negro's account. According to the man's own story his body remained quite white, and it was only the parts exposed to the sun which changed colour. Of his state when Niemeyer saw him we learn that his hair was black, that his white colouring was not pallid like an albino's but like that of a fair European. There were no anomalies of sensibility in the leucotic patches; on the left cheek on the white patches were snow-white short hairs, the chin had a short black beard. Forearms and lower part of legs were the colour of Europeans, except that the nails showed the colouring peculiar to negroes. There were three small black spots on the right wrist. The eye was quite normal; irides very dark and sclerotic darkly pigmented. There was no increase of pigment on the borders of the white spots, which Niemeyer states "is the case with vitiligo in Europeans."

Dr Reinhard's¹ account which supplements Niemeyer does not differ essentially from the above. He tells us that the Kaffir was a schoolmaster in the negro quarter of Pretoria, and that not only his parents, but his *children* were free from any skin disease and of "tadelloser Schwarze." He was born black and remained black until his 16th year, when white spots began to develop themselves, and he is said to have been perfectly white at 25. At 27 first brown and then black spots began to show themselves on the body (?exposed parts, see above) and the face, and these enlarged themselves till in 1894 he had the appearance recorded in our Plate QQ (143). Fourteen days later the pigment had so rapidly developed that his appearance was that of Plate QQ (144), and later the face became perfectly black except a small place round the mouth. The hair of the head remained black notwithstanding that the skin of the head was white. (Dr Reinhard does not refer to the colour of the down on the leucotic patches.) There was no thickening or scaling of the skin and the margins of the white parts were not darker than elsewhere. In a letter² to

¹ We owe the original photographs to the kindness of Dr Reinhard.

² Owing to a request from K. Pearson to Dr Turner to discover, if possible, what had become of this negro.

Dr G. A. Turner (1909) Dr Reinhard says that he saw this negro for two years after the article cited above appeared (1897), and he "observed that sometimes his face showed very few and small white spots whilst at other times it was nearly white with few black spots. Unfortunately, he refused to be photographed again." The negro died of typhoid fever in 1902.

The case, as Dr Reinhard remarks, is extremely unusual, not only on account of the extent of the attack ("ob der Mann jemals wirklich ganz weiss war ist allerdings nicht sicher festzustellen, aber immerhin nicht ganz unwahrscheinlich") and the returning pigmentation, but also on account of the scalp hair, which never, as in most recorded leucoderma cases, appears to have lost its colour. We should not be inclined to lay much stress on the European white of the leucotic patches, because such white is reported in many cases of negro albinism. The possibility of a syphilitic origin for the changes is probably excluded by two independent medical accounts. If we are to consider the case as really one, if a rare type, of leucoderma, then we cannot assert that leucoderma differs from albinism by the occasional possibility of restored pigmentation, for in rare cases of albinism also, there appears to be a development of pigment. The ultimate explanation of albinism must account for these cases of varying pigmentation¹ as well as for stationary absences.

Further we may note that the relative frequency of leucoderma² and its appearance in all climates and races do not form differential characteristics between the two complaints. Lastly, we may remark that any effect on the eyes appears as rare or possibly as unknown in leucoderma as in partial albinism³.

¹ Piffard (*Diseases of the Skin*, 1891, p. 97) even asserts, without detailed evidence, that in the majority of cases there is a return of pigmentation after the lapse of a few years, and speaks of presence and absence of pigment as seasonal and recurrent in cases he has had under observation. Beigel (see Bibl. No. 296, p. 15) refers to the case of a medical student who developed a white pigmentless area on the scrotum. It entirely disappeared after eighteen months. Beigel apparently classes this case with others that are certainly leucodermatous. Lieber (Hecker's *Literarische Annalen*, May 1828, S. 100—2) mentions a case in which leucosis was associated with menstruation, the condition recurring on each occasion. Camper (Hildebrandt's *Lehrbuch der Anatomie*, 1789, Bd. II. S. 354) cites the case of a pregnant woman, whose stomach and regions round mammae became black, but face, hands and arms white. Le Cat (see Bibl. No. 67, p. 141) refers to a peasant woman the skin of whose abdomen became black on pregnancy, but whitened again after parturition; others had the left arm only of a dark colour. Bomare (*Dictionnaire d'histoire naturelle*, Art. *Nègre*) mentions the case of a lady of noble birth (also referred to by de Pauw) who when pregnant became brown, and towards the end of pregnancy as black as a negress, but after parturition gradually resumed her natural colour, no trace of the dark colour ultimately remaining. Other modern cases of a like kind have been put on record. Thus Erasmus Wilson cites (*Lectures on Dermatology*, 1878, p. 24) the case of a young pregnant woman, Martha Weston, aged 18, where the blackness, as deep as a negro's, spread from the areolae over the whole anterior surface of body from clavicles to middle of thigh; it passed away after birth of child. These are exaggerated instances of what is not so extremely infrequent in pregnancy. They are referred to here as indicating how closely change of pigmentation in excess or defect, or possibly *partly in one and partly in the other*, is associated with metabolic changes. It is true that the usual type of leucoderma, as of most cases of albinism, is the absolute or at least relative irreversibility of the depigmentation. But when a full explanation comes, we shrewdly suspect that it will cover the reversible as well as the irreversible pigment changes.

² Kaposi states (see Bibl. No. 333) that leucoderma occurs in 2 per 1000 skin-cases, a frequency in the special class, which can hardly place it much in excess of albinism in the general population.

³ Hutchinson ophthalmoscopically examined the eyes of certain leucodermatous cases and found no

If leucoderma be but albinism in the making, a dynamic rather than static leucosis, we should expect to find that, like complete and partial albinism, it is hereditary. It is difficult to say how far negative evidence is of any value in such a case, because the view that it is never hereditary having been once accepted no careful inquiries on the subject have probably been made¹. Crocker reports a case in which for three generations, grandmother, mother and daughter, leucoderma occurred². Recently K. Pearson came across an obvious sufferer, who reported that her mother, grandfather and other relatives were also leucodermatous. Full details are given in our Appendix, Extra Pedigrees. Gould and Pyle³ give a family of three children all subjects, they say, of leucoderma. Their figure represents two girls and a boy, with decidedly negro features; all are clothed, neither body nor feet being shown. As far as can be seen the patches are fairly symmetrical, and in all three there is a broad area of white occupying centre of scalp, forehead, root and possibly bridge of nose corresponding to the "flare" of some cases of partial albinism: see our Plate XX (165). The eldest sister appears to be 13 or 14, the boy 12 or 13, and the younger sister 10 or 11. We believe this to be really a case of congenital piebaldism and not hereditary leucoderma. This "Leopard Family" has a strong family resemblance to "The Three Graces": see our Plate VV (158) and the Chapter on Partial Albinism, p. 249. A case with more detail is that of our Fig. 551 in which five siblings are at present affected and it is known to have existed in the family for three

indication of pigment loss, none of the cases, however, appear to have had leucosis in the neighbourhood of the eyes (*Lond. Hosp. Reports*, Vol. I. pp. 11 and 12). Smester (1879, see Bibl. No. 362) cites a case of leucoderma in a negress in which: "La rétine commence à se décolorer, et les yeux se ferment très légèrement quand elle regarde l'éclatante lumière du soleil de son pays" (Haïti). He does not say that he used the ophthalmoscope. Beigel in a letter to Virchow (1868, see Bibl. No. 310, S. 482) records the case of a pitch-black and hairless horse exhibited at the Crystal Palace, which began to grow white below the left eye, and the "Augenhintergrund" became lighter although the pupil remained dark. Crocker (1903, see Bibl. No. 499, p. 624) notes a case in which leucoderma was associated with *retinitis pigmentosa*, the patient stating that leucoderma had commenced with defective sight nine years previously; any causal relationship must of course be accepted with caution. E. Nettleship reports a case of leucoderma limited to left side of the body (left half of beard, also many white patches on L. mastoid region and L. back of neck, and one small white pencil of hair on L. occiput, large white patches on back of L. hand and forearm; no patches anywhere on R. side) coming on acutely with disease of the eye on the same side—detachment of retina. Hutchinson (Case IV) reports a man of 30, an engineer, hair jet black and complexion swarthy, almost olive brown, with leucoderma for two or three years. He had failing sight in one eye, there was nothing, however, abnormal in the choroidal pigment (*Clinical Lectures and Reports London Hospital*, Vol. I. p. 12, 1864). But this is small demonstration of any real eye effect, and comparable with it may be cited the vague report of a piebald or partial albino with red pupils, see our p. 131.

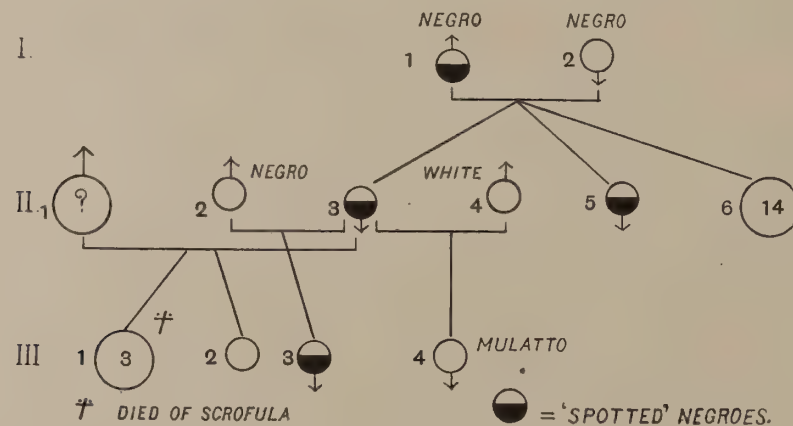
¹ Hutchinson (*Archives*, I. p. 378) states that it is "never hereditary," yet in the same place he cites a case in which pigment variation occurred in several siblings, white hairs on the head of a leucodermatous female and of her brothers and sisters turning dark after infancy.

² See Bibl. No. 499, p. 623. Dr Crocker was unable to put us in touch with this interesting case as he had lost the name of his informant, the former medical student and member of the family.

³ *Anomalies and Curiosities of Medicine*, 1897, Fig. 293. Dr Gould could give no further information as to the post-natal character of the leucosis.

generations. The reader will find an account of the family under Fig. 551, but later information and a slip of the engraver have led to the need for some modifications. I. 2 the maternal *grandfather* and not I. 3 the maternal *grandmother* was the subject of leucoderma. I. 2 was the eldest of his family, his siblings (I. 1) in order were a sister, three brothers, and a sister, neither they nor their offspring are to the knowledge of our informant leucodermatous. The order of birth of Generation II. has now been determined. 1st, II. 1 a son died single; 2nd, II. 4 a son with seven children; 3rd, II. 8 a daughter unmarried; 4th, II. 3 a son with four children; 5th, II. 5; 6th, II. 7 a daughter with five children; 7th, II. 2 a *daughter*, not a son, with eight children; 8th, II. 9 a daughter unmarried. II. 5 and 9 as reported are the sole leucodermatous members, and none of the offspring of the others have the disease. Of the Generation III., III. 4, III. 5, III. 7, III. 9 and III. 12 are married and have respectively 12, 3, 4, 2 and 0 children; none of these children have at present signs of leucoderma, but they are relatively young, and the future of the offspring of III. 4 and III. 12 will be awaited with some interest. There can be little doubt that this family shows that at any rate the constitution which tends to leucoderma is inherited, and probably inherited only through affected members.

Another case of apparently hereditary leucoderma is given by Dr Joseph Jones (Bibl. No. 317, p. 693). The pedigree is provided below. I. 1 and I. 2 were native Africans. I. 1 had white lips and hands and presented a condition similar to that



of his daughter, II. 3. This woman, Lemisa Bert, seen in September 1867, had true African features, and was aged 45. She was born in Tennessee, and was following the occupation of a rag picker about Nashville. She had been turning white during the last 19 years; the change commenced in small spots, which had progressively increased. She complained of some itching of the skin during warm weather; no disease of the skin was detectable with a magnifying glass. She had enjoyed good health except for "falling of the womb." The palms of her hands were white, there were perfectly white spots on the arms and neck; on the right arm near the axilla a large spot about four inches in the longest and three inches

in the shortest diameter (see Plate XX (167)). Under the magnifying glass these spots exhibited the same appearance as the skin of the white, and the blue veins were distinctly seen as in the fairest skin. She had a sister, II. 5, more extensively spotted than herself, and some of the spots were of a *yellow* colour. There were 14 other siblings, II. 6, apparently normal. II. 3 had six children, two at least by different fathers, three of them, III. 1, died early, she said of scrofula. Of III. 2 no information is given, it was presumably normal. III. 3, a young woman of 18, had a negro, II. 2, for father, she was spotted like her mother only to a greater extent, many of the spots were of a *yellow* colour. III. 4, the youngest child, was the offspring of a white man, and was a smart mulatto girl of 11 years. It will be seen that the tendency to leucoderma has been noted in three successive generations.

A further case of very great significance, that of our Fig. 286, is also due to Dr Joseph Jones: see our p. 259. In this we have a negro with white spots on arms and legs which increased with age. Children and grandchildren were also white spotted, but one of the grandchildren was xanthous and two of the great-grandchildren were complete albinos. There thus appears to have been a family history of leucoderma culminating in albinism. The pedigree is of great suggestiveness as indicating that pigmentation abnormalities run in definite stocks and are probably interrelated¹. Thus we have now on record five definite cases in which leucoderma has been ascertained to be hereditary, three white and two negro families.

The history of leucoderma—by which we understand the usually painless loss of pigmentation from portions of hair and skin²—is a long one. Leviticus, chap. xiii., contains much confused information from an early date as to leucosis, but the commentators have not found it easy to say which passages refer to partial albinism and which to leucoderma.

Celsus, who is mentioned by Quintilian, wrote eight books of medicine and introduced the general term *Vitiligo*³, the derivation of which is uncertain. He

¹ The interrelationships between partial albinism, xanthism and complete albinism will be referred to later in this monograph.

² The statements that in some cases the skin, but not the accompanying hair, in others that the hair and not the skin has grown white led us to inquire in the cases known to us whether the leucosis of skin or of hair in the same patch was the earlier, as a knowledge of this might explain some of these cases. The reply received was that the leucoses of both were *simultaneous*. Loss of hair pigment with leucoderma is well known and we may cite cases recorded by Flatau, 1893 (Bibl. No. 445), Kaposi, 1874 (Bibl. No. 333), Hutchinson, 1864 (Bibl. No. 299), Oliver (Bibl. No. 196). On the other hand Brown, 1824, recorded the case of a negro, whose skin turned gradually white after a surgical operation, but whose hair did not lose its pigment (Bibl. No. 183).

³ Vitiligo quoque, quamvis per se nullum periculum adfert: tamen & foeda est &, ex malo corporis habitu fit. Ejus tres species sunt. *Ἀλφός vocatur, ubi color albus est, fere subasper & non continuus, ut quaedam quasi guttae dispersae esse videantur. Interdum etiam latius, & cum quibusdam intermissionibus serpit. Μέλας colore ab hoc differt, quia niger est, & umbrae similis, caetera eadem sunt. Λεύκη (Leuce) habet quiddam simile alphi sed magis albida est, & altius descendit; in eaque albi pili sunt, & lanugini similes. Omnia haec serpunt: sed in aliis celerius, in aliis tardius. Alphos & Melas in quibusdam variis temporibus oriuntur & desinunt. Leuce, quem occupavit non facile dimittit.

Priora curationem non difficillimam recipiunt; ultimum vix unquam sanescit; ac si quid ei vitio demptum est, tamen non ex toto sanus color redditur. Utrum autem aliquod horum sanabile sit, an non;

divided it into three types, one of which *Leuce* has been by some writers identified with leucoderma. But the description is almost as vague as that of the types of leprosy in Leviticus, and the generic name vitiligo has, especially by German writers, been made to cover a wide range of diseases, inflammatory or otherwise, which permanently or temporarily involve loss of pigment¹.

A fairly full account of the history of leucoderma in the works of the early dermatologists was given by Beigel in his memoir of 1864² and by this memoir, and by another four years later³ he attracted much attention to the subject. But his classification cannot be considered satisfactory; he divided albinism (absence of pigment) into *Albinismus totalis* and *Albinismus partialis*, the latter included not only leucoderma, but congenital partial albinism and apparently incomplete albinism. Thus he gives an excellent example, reproduced in our Plate A, of a case of leucoderma in a European, and entitles it *Albinismus partialis*; we have preserved his title but added the word "progressive," to mark that it is really leucoderma. In this case the hair grew white, and unpigmented spots appeared at the age of 13 following a severe attack of abdominal typhus. At the age of 20 gastric fever resulted in a further progress of the white spots, and this did not cease for a year and a half. The curious points are that the hair but not the skin of the head lost its pigment⁴; the pubic region lost its pigment, and when the pubic hair came it had the peculiar flaxen character of albinotic hair. It is obviously needful to distinguish such a case from one of congenital partial or from one of incomplete albinism. Yet Beigel's fourth case is one of incomplete congenital albinism, albinism of the hair only. "It concerns a young Englishman, Mr E., who in respect to his hair gives one wholly the impression of an albino. The hair of the head is neither snow-white, nor *hellblond*, but the colour is light yellow-white, such as is only met with in the case of *Kakerlaken*. At the same time the hair is extremely fine and flaxlike. This holds also for eyebrows, eyelashes, and hair of axillae and pubes. Mr E. has no beard although he is 21 years of age. The skin of the whole body is extremely delicate but normally pigmented. Nothing abnormal in the fundus was observable with the ophthalmoscope although Mr E. is markedly shortsighted. This condition, whereby Mr E. attracts everybody's attention, is congenital⁵."

experimento facile colligitur. Incidi enim cutis debet, aut acu pungi; si sanguis exit, quod fere sit in duobus prioribus, remedio locus est: si humor albidus, sanari non potest. Itaque ab hoc quidem abstinendum est. Then follow remedies, chiefly dressings: see Bibl. No. 7.

¹ The writer (Blanchard) on Albinism in the *Grande Encyclopédie* (see Bibl. No. 415) speaks of vitiligo as "l'apparition spontanée, c'est-à-dire sans cause connue, sans le moindre trouble local dans la sensibilité ou dans la nutrition, de taches albines qui se montrent en différentes points de la surface du corps...." He evidently identifies vitiligo with our leucoderma, and does not recognise the sense in which Bateman, Bärensprung and others have used the word, *i.e.* the existence of local trouble during some period of the leucosis which appears to differentiate their vitiligo from the modern idea of leucoderma.

² See Bibl. No. 296.

³ See Bibl. No. 310 (Bd. XLIII.).

⁴ Sometimes the hair remains normally pigmented on the leucodermatous patches: see Kaposi (Bibl. No. 333, p. 176 et seq.; also ftn. 2 on the previous page).

⁵ See Bibl. No. 296, p. 15.

Beigel, in short, terms all cases, whether congenital or acquired, provided there be no externally observable change in the structure of the skin, *partial albinism*. He reserves the name vitiligo for those cases in which, besides loss of pigment, there is change observable in the structure (*e.g.* "durch Ablagerung eines plastischen Exudats in das Hautgewebe, welches niemals in Eiterung übergeht und sich meistentheils über die umgebende Haut erhebt"). While we may approve Beigel's attempt to differentiate "vitiligo" from partial albinism, it seems undesirable to use one name for three separate types of leucosis, incomplete albinism, partial albinism and leucoderma, until we are far better acquainted than at present with their interrelationships.

Beigel attempts to render his classification symmetrical by setting against his total and partial albinism, a *nigrismus totalis* and a *nigrismus partialis*, both only observable in white or semi-white men. He includes under these headings every darkening of the skin, from freckles to the complete nigrescence of vagabond's disease, and covering special cases like those of Goodwin¹ and Wells², whether acquired or congenital, or affecting the whole or parts of the body. These matters do not concern us primarily, but points raised by Beigel deserve further consideration. Namely, he insists that pigmentation changes, whether in the direction of leucosis or nigrescence, are largely due to modified nerve-action produced by shock, illness³, severe chill or other nerve upset, and that these pigment alterations have a distribution correlated with the nerve system⁴. Beigel cites a number of cases in which leucosis in one part

¹ See *Medical and Physical Journal*, Vol. xxv. p. 23, London, 1811. Goodwin's Case—which has passed from Beigel into the textbooks—appears to have a very slender foundation. This is all: "Miss E. a single woman of about 60 years of age, till about 20 years hence, was of a natural fair complexion; when having an illness of some continuance she perceived on her recovery that her complexion had changed to a dark hue, which has since gradually increased to that of the darkest native of Africa. Miss E. is in general good health, but occasionally complains of rheumatism." Another case of bronzing of the skin simulating Addison's disease, but according to the reporter, Dr James Russell, hereditary in the family for three generations, will be found in the *Medical Times*, Vol. i. p. 571, London, 1871. With regard to such cases, of which so little detail is given, we may cite the bronzing which occurs in some cases of tuberculosis, which was noted as early as 1869 by Jeannin and afterwards by N. G. de Mussy: see also F. W. Andrewes: "Two cases of tuberculosis with an unusual pigmentation of the skin and deposit in the suprarenals," *Saint Bartholomew Hosp. Reports*, Vol. xxvii. pp. 109—116, London, 1891.

² See Bibl. No. 162 and our p. 118 ftm.

³ Oliver (*Dict. de médecine*, T. xvii. obs. ccvii. p. 369) mentions a case of partial leucosis with decoloration of the pubic hair following bronchitis and gonorrhoea in a man of 22.

⁴ See on this point papers by G. Lenthal Cheatele: "The points of Incidence compared of Cancer, Leucoderma and Scleroderma," *Brit. Med. Journ.*, April 29, 1905 and "The Mental Nerve Area and its Relation to the Greyness of Hair," *Brit. Med. Journ.*, July 4, 1908. Adamson showed at the Royal Society of Medicine (Dermatological Section), Feb. 20, 1908, a girl aged 16 with a large leucodermatous area on left chin and neck upon which were three patches of scleroderma; the area corresponded to the distribution of the second and third cervical sensory nerves, and in part to that of the third division of the fifth cranial (*Proc. Roy. Soc. Med.*, Vol. i. No. 5, 1900). A counterpart of many of these acquired or congenital white areas following nerve distribution is to be seen in the rare instances of the whitening of the eye-lashes in certain cases of diseases of the eye (*Irido-cyclitis*) see Bibl. Nos. 329, 390 and 435, and of the whitening of the skin other than in ordinary leucoderma described by Hutchinson as *Morphoea herpetiformis* (*A Smaller Atlas of Illustrations of Clinical Surgery*, 1895, Plates LXXXIX. and CXXXV.).

has been accompanied by nigrescence in another¹; there seems good evidence for asserting that such leucosis or even leucoderma has been found associated with Addison's disease²; even freckles occur mostly in those rufous persons who are more closely allied than blonds to albinos or even in albinos themselves³; while leucoderma itself appears to run in neurotic strains⁴, and the albino, whether in man or the lower animals, appears in the great majority of cases to have a lower nervous organisation; it is more shy and apprehensive than the normally pigmented individual. Beigel has summed up in another memoir⁵ his position with regard to the relations between nerve affections and pigment anomalies⁶:

"Nervous affections in general like to reflect their existence not only in the nerve centre, but also at the other peripheral end. Deviations of the most varied kind are therefore to be found extremely often in diseases of the nervous system, and epileptics with a healthy normal skin belong undoubtedly to the exceptions. Such at least was the case among some hundreds of hospital patients whom I afterwards examined; albinism, nigrism, psoriasis, herpes, severe acne⁷, were everyday appearances, and if a special form of skin disease was absent, the skin itself was at least rough and of unusual character."

We shall see later that the fuller study of mental cases has in part, but only in part, confirmed this somewhat exaggerated statement of Beigel. But the idea in it is not without suggestiveness when we come to analyse the correlation between albinism, or albinotic stocks, and various types of degeneracy. A further point, to which Beigel was among the first to draw attention, is that the very parts of the body which in the normal condition are distinguished by a stronger pigmentation—*e.g.* the region round the nipple, the scrotum, the orificium ani⁸, etc.—are among the first to exhibit pigment-anomalies. This applies not only to partial albinism but to leucoderma as well.

¹ See, for example, Erasmus Wilson's Case, Plate XXXIII. (? Addison's disease), and Russell Reynolds' Case reported by Beigel, Bibl. No. 310. Hebra (Kaposi) states (Bibl. No. 333, Vol. III., 1874, p. 179) that the patches of leucoderma often commence in the neighbourhood of a pigment mole (naevus) or a brown flat acquired wart.

² Levi found albinotic decoloration 12 times in cases of Addison's disease (see Bibl. No. 319 and also a case reported by Norman Dalton, *Proc. Roy. Soc. Medicine*, Vol. I. p. 209, Clinical Section, with reference to another case observed by Leech).

³ Sir T. McCall Anderson, *Diseases of the Skin*, 2nd Edn. p. 32. A discussion of the relation of the rufous to the albinotic and of the freckled to the rufous will be given later in this monograph.

⁴ See the opinion of Crocker cited on our p. 199, and confirmed in the cases examined for this monograph; see our p. 199 and Fig. 551.

⁵ See Bibl. No. 310 (Bd. XLIII.).

⁶ Leucoderma has been associated with retinitis pigmentosa, with Graves' disease (Dr J. F. Schamberg of Philadelphia in a letter of Nov. 28, 1906, reports having observed four or five cases) and alopecia areata (Sir T. McCall Anderson, *Diseases of the Skin*, 2nd edn., p. 47), but in this case it seems probably doubtful whether the change is true leucoderma.

⁷ It must be noted that bromide given for epilepsy may produce a number of skin eruptions, especially a form of acne.

⁸ Hutchinson remarks that he has often seen white patches on scrotum, perineum, and the darker parts of skin (*Clinical Lectures and Reports*, Vol. I. p. 7, 1864).

The preceding account will have shown how gradually congenital partial albinism and painless leucoderma became distinguished from residual forms of leucosis in which an associated feature was structural change of a sensible kind accompanied by suppuration or irritation. It is not quite easy to classify the nature of these residual leucoses which the writers of the third quarter of the last century spoke of as vitiligo, a term still largely in use outside this country. They may, perhaps, be distinguished from albinism and leucoderma by the term *chrotrepic*, which of course must be understood to have reference only to macroscopic changes. We consulted Dr James Galloway, who suggested the above name, and he most kindly replied (13/10/09) to our question as to what the older writers included under vitiligo as follows:

"The forms of depigmentation of the skin described by earlier authors, preceded by inflammatory changes, pain, itching, etc., were, the majority of them, no doubt of syphilitic origin. The superficial syphilides are numerous; they leave various degrees of pigment which very often tend to reform, or rather the colour tends to be restored; structural change of the skin remains. There is also a depigmentation closely resembling leucoderma, lasting, it may be for years, *without* apparent destruction of the skin, occurring in syphilis, and usually ascribed to this disease. There is little doubt that the majority of the cases of 'leucosis' preceded by inflammatory disturbance were really syphilides. No doubt, however, the older authors included other inflammatory conditions of the skin of ordinary or specific nature, *e.g.* certain varieties of tuberculosis, in this same category. Of still rarer conditions many of the cases of morphea and scleroderma would have come under the same heading. There are still rarer conditions of loss of pigmentation, associated with changes of structure, probably in the first instance due to nervous, or other interference with the circulation, which are now recognizable, but in days gone by would have fallen into the same category of vitiligo."

There is sadness in the burial of a name which like vitiligo is of classical origin and has survived through the centuries. But the confusion which has grown up round the use of the word, prevents us from adopting Beigel's definition of the term (see our p. 206). Some dermatological authority may possibly be able in the future to revive vitiligo for a differentiated category of the chrotrepic class of skin changes¹. But this will hardly concern the student of albinism. For him leucoderma is the essential pathological pigmentation change, wherein he sees albinism in the making, at least as regards hair and skin; and if he could understand the metabolism involved in this form of dynamic leucosis, there is little doubt that the obscurity of static or congenital leucosis would be largely dispelled.

We now proceed to show the universality of leucoderma, a feature in which

¹ Sir J. Hutchinson, following Mr Startin, has recently (*The Polyclinic*, Vol. XII. p. 63, 1908) used the term vitiligo in association with certain subepidermic ivory white scars—often as big as a three-penny bit—which may be left by an eruption which has been inflammatory, but not actually ulcerated.

it differs essentially from various other leucotic types of skin diseases which appear to be peculiar to certain tropical districts, *e.g.* pinta¹. We shall distinguish between partial albinism and leucoderma; this has not been done by the earlier writers Rayer, Simon and Beigel². Although there appears at present no means—other than the history of the origin—of distinguishing between stationary leucoderma and congenital partial albinism, still the history of the origin will serve in most cases to guide us in classification. The reported cases of leucoderma are now so numerous that it would be impossible to give here a complete list, we can only refer to certain cases illustrating its nature, or of peculiar interest on historical grounds.

European Cases. Beigel's German case is figured in our Plate A. Its noteworthy features are the whiteness of the hair without whiteness of the scalp skin. The symmetry is moderate, but not so great as in some cases. A much more symmetrical case is that of Mr S. (see our pp. 198—9). Here both cheeks, chin, superciliary regions, a wedge on the forehead, are leucotic; there are patches on back of both arms below elbows, on both buttocks towards back, on both calves; also on both sides of the trunk, in axillae, on hips and on outer aspect of thighs. Besides these places there are symmetrical patches on the lumbar region and on front of abdomen both above and below umbilicus. Hansen³ gave a good account (1869) of two German cases with an excellent photograph—in origin and development it corresponds closely with our experience in the case of the leucodermatous Yorkshire family (Fig. 551)—*i.e.* there was as usual no pain nor inflammation of any kind in the course of the leucosis (see p. 198). This difference makes us doubt whether the cases observed by Bärensprung⁴ with “*schleichende Entzündung der Haut*” and dropping off of the hairs are to be classed with true leucoderma. Simon⁵ describes the case of a girl (presumably German) aged 20, with white patches on various parts of the body, both sides of the neck, and on the head, the hair of the scalp (elsewhere of a fair reddish colour) being white on the affected patches. The principal areas on the head were a large one at the back and another large one “in the middle line” of the front affecting also the forehead; there were besides

¹ Professor A. Forel has given an account of “vitiligo” among the Columbians (see Bibl. No. 473), which he directly compares with Reinhard's Pretoria case of leucoderma (see our p. 201). He saw at Dibulla, a town at the foot of the Sierra Nevada and between this and Santa Marta, a population of hybrids between Negroes, Indians and Spaniards, in which vitiligo was endemic, *die meisten Leute daran leiden*. “*Dieselben sehen ganz buntscheckig aus; meistens am ganzen Körper, indem die Vitiligo unregelmässig vertheilt ist, meistens in vielen kleinen Flecken. Sie sind nicht schön weiss und schwarz, sondern braun, röthlich, gelblich und weisslich gefleckt und sehen dadurch ungemein hässlich und sonderbar aus.*” Forel states that this vitiligo (*freilich wohl weder acquisirt noch verschwindend*) is far from a rarity and he recommends the study of it in Santa Marta and Dibulla. It is difficult to know on what grounds he assumed it to be congenital; if so it is not comparable with Reinhard's case. It appears to fall rather into the same category with the “spotted Tartars” and “Pintos” (see our pp. 171—2). It is of interest, however, as another case of pigment anomaly following racial mixture (see Fisher's Case, p. 217).

² See Bibl. Nos. 179, 282, 296 and 310.

³ See Bibl. No. 319.

⁴ See Bibl. No. 257.

⁵ See Bibl. No. 282, Case 29.

various small bunches of white hair on other parts of the head. The white patches in this girl were noticed "quite early" in life, but the exact age at their commencement is not stated; they increased gradually in number and size¹. Simon's Case 25, ♀; Case 26, ♂, starting at 17, patient died at 37; Case 27, ♂, beginning at 14; Case 28, ♂, aged 24, beginning on hands and spreading in six weeks; Case 29, ♀, case cited above; Case 30, ♂, soldier; Case 32, ♀, beginning after middle life, appear to have been clearly all leucoderma. Of Case 31, a woman whose whole skin was found to be abnormally brown, almost gipsy colour, and scattered over with quite white spots of unusually large size, on the head also a white spot covered with white hair—there is not enough information to determine whether it was leucoderma or partial albinism.

As a French case we may note Gaultier's case of Charles Ferron, sometimes cited as Pelletan's Case, but we believe first published by Gaultier², under the title of "*Leucozoona, partielle, accidentelle*."

Sur la variété blanche: "Charles Ferron, cocher de fiacre, âgé de soixante ans, présente sur sa peau plusieurs taches d'un blanc de neige: elles sont disposées assez symétriquement. Elles existent aux deux aines, sont assez larges, s'étendent irrégulièrement et sont réunies l'une à l'autre. Les trois-quarts du pénis du côté adhérent et dans tout son contour, le scrotum dans les trois-quarts de sa surface, la peau de la partie supérieure interne des cuisses correspondant au scrotum, une partie du côté externe des deux cuisses, la région sacrée, lombaire et dorsale sur la ligne médiane, dans une étendue de douze pouces de bas en haut, sur trois de largeur, offrent aussi ce même blanc de neige; fait qui contraste avec la couleur naturelle légèrement brunâtre, que la peau dans les autres parties a conservée; les poils sont blancs dans les endroits où la peau est blanche. Sur plusieurs parties voisines à celles indiquées, on voit de très petits points blancs qui entourent les poils; quelqueuns de ces points sont plus étendus et paraissent en s'arradiant de ces petits centres, avoir imprimé leur couleur, et formé des taches blanches sur une plus grande étendue. Cet homme quoique livré depuis trente-cinq ans aux pénibles travaux de son état n'a éprouvé que de très-légères affections: il n'a jamais eu d'affection cutanée; il est fort, vigoureux. La couleur blanche a commencé à se manifester le printemps, à l'âge de quarante-neuf ans, sur le pénis; elle s'étendit assez lentement. Le printemps et l'été ont été les époques les plus favorables à ce développement, qui a lieu sans prurit ni douleur. On a employé inutilement des moyens pour rétablir la couleur, et pour arrêter les progrès de l'altération. Depuis la puberté il a sur le dos du nez une touffe considérable de poils. (Nous avons recueillies cette observation dans la salle de chirurgie de l'Hôtel-Dieu, sous M. Pelletan. M. Alibert nous a fait remarquer un pareil fait dans sa clinique à l'hôpital de St Louis.)"

The account is a full and suggestive one from more than one aspect.

¹ This may be another case of return of pigment, for Simon records that some of the spots afterwards became less conspicuous (? contrast), and "*die Flecken verschwanden zum Theil ganz*." Cf. our p. 200.

² See Bibl. No. 147, pp. 76—8.

Hutchinson gives two English cases of leucoderma beginning in very early life¹:

Hutchinson's Case 1. A boy aged 12, with jet-black hair and very dark eyes, and with white patches on various parts of the body. "His mother noticed the first white patch more than eight years ago. It was very small, the size of a sixpence, and on his chest, at a part where a blister had been applied....From that time to the present, the white patches have been gradually increasing in size and number." There was a rude ("very inexact") symmetry about the distribution of the patches. Those on the back were very large, and at first sight quite irregular, and on the chest the left nipple was included in one whilst the right nipple was on healthy skin. On each upper eyelid was a longitudinal patch, and on each thumb a patch nearly corresponding with one on its fellow. In front of each wrist, behind both knees and in front of each thigh in the femoral regions were nearly symmetrical patches. There were some patches on the scalp, one of which grew white hairs.

Hutchinson's Case 2. A lad aged 19, with arrested sexual development and having the make and bearing of a boy of 12. He had large white patches, abruptly limited, with convex borders, and placed on the two halves of the body with a fair degree of symmetry. Nearly the same parts were affected as in Case 1 (*supra*). The lower part of his abdomen and his scrotum were entirely blanched, excepting two or three small portions of skin which retained their full quantity of pigment and contrasted most strongly with the rest. "As regards the history of the decolorisation, we are told that he had some patches in infancy, indeed his mother thinks he was born with some. They extended in childhood, but he does not himself think that they have done so lately."

Hutchinson also gives a picture of leucoderma in a Portuguese woman and says that he has been informed that it is very common among the Portuguese². Hutchinson among at least fifty cases seen by 1870, records leucoderma in a German Jew³ and in a Russian⁴.

Leucoderma in a Gipsy. An interesting case of leucoderma in a gipsy is given by Pittard⁵, who states that he has never encountered among the thousands of gipsies he has examined any case of albinism, complete or partial, only this single case of "acquired albinism." She was perfectly healthy⁶, aged 30, and when first seen was engaged in thrashing corn. The depigmentation had reached all the body except the greater part of the face; the depigmented skin was clear, rosy white and delicate, showing the veins and comparable with that of the most beautiful European women; it contained some freckles scattered about. The pigmentation was most intense in the skin of cheeks and nose. "Des grandes taches

¹ See Bibl. No. 299. The lad in Case 1 also formed the subject of the illustration of leucoderma in the *New Sydenham Society's Atlas of Skin Diseases*, Plate X.

² *Loc. cit.*, *Catalogue of N. S. Soc. Atlas*, pp. 37—8. ³ *London Hosp. Reports*, Vol. I. p. 10, 1863.

⁴ *Lectures on Clinical Surgery*, Vol. I. p. 34, 1879. ⁵ See Bibl. No. 509, p. 317.

⁶ Pittard gives anthropometric details to show she was not inferior to other members of her tribe.

brunes portaient de la région temporale proche de l'œil et du dessous de celui-ci, remplissaient les joues et formaient une traînée descendant entre la commissure des lèvres et la région du maxillaire pour s'arrêter à quelques centimètres de la limite de la figure. Le nez était tout entier fortement pigmenté. En dehors de ces deux régions des joues et du nez, le pigment qui était demeuré était moins abondamment répandu. Il y avait quelques taches à la partie inférieure du front, au-dessus des sourcils; des taches symétriques à gauche et à droite. C'était la même chose entre le nez et la bouche, et au menton. La moitié à peu près de la région située au-dessous de la bouche présentait des traînées et des taches de pigment. Celles-ci étaient plus abondantes inférieurement que supérieurement, c'est à dire près des lèvres. Les parties de la figure devenues blanches étaient: presque tout le front, au-dessus de la ligne ophryaque; les deux oreilles; le pourtour de la face; quelques centimètres tout autour du masque. C'est ce pourtour, cette marge blanche, autour du masque brun, qui donnait à cette femme l'aspect bizarre qui nous avait immédiatement frappé. Les cheveux qui étaient abondants, sans être bien longs, étaient restés fortement pigmentés, d'un brun foncé, presque noir; et cela sur toute leur longueur... Les yeux étaient également pigmentés de couleur brune." Elsewhere Pittard says the choroid was unaffected. Unfortunately he could not obtain any information as to the locality of onset or the age of onset beyond "quand elle était encore petite." Her companions accounted for her appearance by saying that she had slept outdoors one night in the full light of the moon, her face hidden in her hands!—The description of the face and hair to some extent agrees with that of the leucodermatous Egyptian girl of our Plate D (9) and (10).

Leucoderma in Egyptians. The earliest mention of an Egyptian case—if we put on one side Arabian and Jewish references, which we cannot definitely classify—is probably that of Sonnini¹: "In a number of diseases which I have had occasion to prescribe for, I observed a very singular one on the skin of an inhabitant of Siout. His complexion, like that of all the other natives of the same southern cantons of Egypt, was of a deep brown. But about five or six years before, a part of this blackish skin had given place to another perfectly white; these white spots were spreading more and more, so that when I saw this man, his face, arms and hands and his whole body, were covered, and, as it were, marbled with large flakes of brown and white; the blackish skin was disappearing gradually, and it is to be presumed that his skin will have become as white as milk. He did not experience in other respects, any pain or uneasiness." Sonnini states that Forskal² has asserted that the spots are never visible round the navel or on

¹ See Bibl. No. 132.

² Niebuhr in the chapter "Médecine des Arabes" of his *Description de l'Arabie*, Copenhagen, 1773, has (p. 120) a note by Forskal, from which it would appear that *behag* stands for leucoderma; it is not clear whether *barras* stands for albinism in its complete form—it is used when the whole of the body is white. The Arabs say that the affection can be cured, if the hairs on the white patches remain black, but it is incurable if they become white. The point is of interest as Beigel, Kaposi, Duhring and others have noted that the hair does not always bleach if the skin whitens. Niebuhr (p. 119) saw a leucodermatous negro at Mocha who had been relieved (?disease checked), but not cured, by sulphur.

the hands, but that his own observations convince him of the contrary, for the man of Siout had these very parts overspread with white spots. This is also the case in the photograph of the Arab on Plate D (11), which together with that of an Egyptian girl we owe to Dr Sandwith. These record far better than any verbal description can do the appearance of the affection. In the Egyptian girl¹, Plate D (9) and (10), the leucosis is very extensive on the face, upper part of trunk, legs below the knees, arms and hands; the arms are almost entirely white. The parts least affected are the thighs and front of the body. The symmetry although not exact is very well marked. No particulars as to age of onset were given. The Arab man provides also an interesting illustration of symmetry. Here as in most fully described and definite cases of leucoderma the "flare" is absent².

Leucoderma in a Bengalee. As early as 1818, Duncan³ reported as "A case of change of colour from Brown to White in a Native of Bengal," the occurrence of leucoderma in an East Indian. His parents were normally dark Mahomedans. He left India at the age of ten or eleven, and had resided since in Edinburgh, chiefly as a servant, but for nine years as a mason's labourer and with other casual employment. During this period he gradually lost his native dark colour and became white. He attributed the change partly to climate and partly to the lime in the mortar, which occasioned much itching in the skin. The change commenced in the hands and head, and the hair from being black and lank, became light gray and somewhat curled. The parts which last retained their colour were the breast and back of the neck. The only remains of his original complexion in 1818 were some irregular patches of a dark purplish colour covering the upper parts of the cheeks, and the prominence of the ears, and a lighter patch at the tip of the nose (cf. Pittard's Gipsy and Sandwith's Egyptian girl). During the change of his colour no sensible alteration was observed in his health, and the complaints for which he was admitted to the Edinburgh Infirmary were "so slight that it is unnecessary to state them⁴."

We have come across no *detailed* accounts of Chinese, Melanesian or Polynesian cases of leucoderma, although such cases undoubtedly exist and have

¹ Letter to E. Nettleship dated Oct. 2, 1907.

² In nine cases of leucoderma, which I have come across personally, there has been no "flare." This serves at least to indicate that if it really occurs, it is certainly not the rule. K. P.

³ See Bibl. No. 164.

⁴ Hutchinson (see Bibl. No. 455) gives a case of unilateral streaks and patches of white in a Hindoo. He says that it is a remarkable case of *congenital* affection of the skin. He gives no evidence of this fact, except the statement that the disease is evidently mapped out during intra-uterine life. He considers *Ichthyosis herpetiformis* the best descriptive name at present (1895), and says it constitutes "a very important piece of evidence as to the possibility of unilateral disturbances of nutrition during foetal life." He compares it with *Herpes zoster* and says the affection is *the converse as regards colour* of what are occasionally seen on the white skins of Europeans. The streaks and patches Hutchinson remarks are suggestive of nerve distribution (see our ftn. p. 206), but it is impossible to trace their location in connection with any known nerves. We have not endeavoured to class this case, but merely refer the curious reader to the *Smaller Atlas* for details.

probably been described. Pittard refers to a photograph by Dr Fusier exhibited in 1878, and mentioned by Topinard (*locus?*), which represented "des marbrures et des îlots de décoloration chez un Jaune"—probably a Chinaman. But we are able to give (Plate WW (162)) the photograph of a Chinese case observed by Dr Cousland, and kindly forwarded to us without comment by Dr G. Duncan Whyte of Swatou, Kwang-tung. We have no details and assume the case to be one of leucoderma, it *may* quite possibly be one of congenital piebaldism.

Leucoderma in North American Indians. The earliest fully reported case is due to Bissell in 1817¹. Samuel Adams, the subject, belonged to the Brotherton tribe of North American Indians near Clinton, N.Y. He began to turn white at 60, and when seen he was 90 years old, but was remarkably vigorous physically and mentally. The skin began to go white soon after an attack of acute rheumatism, the first appearance being a small spot near the *scrobiculus cordis*; soon after spots appeared on different parts of body and limbs, gradually increasing in size. He was greatly alarmed and visited different mineral springs in the hope to remove so odious a colour by ablution in these waters. Finding these measures ineffectual and convinced that no danger was to be apprehended from a white skin, he relinquished the idea of regaining his colour and, to use his own words, "patiently submitted to become like the white men in everything but their dishonesty." The change did not go on uniformly although always in progress; sometimes it advanced rapidly, at other times it was almost stationary, and he could not trace it to seasonal or other sources. When seen the original colour only remained on the forehead, the forefront of the face and neck, with a few patches on the arms. The skin was white, soft and pliable, and not of the dull chalky or livid hue generally observable in the albino (see, however, our section on N.A. Indian albinos, p. 110); it resembled the delicate skin of a European female. Adams had noted three differences between the white and normal black (*sic*) skin, (i) the perspiration was somewhat less on the white areas than on the black, (ii) the white areas blistered and became very tender, if exposed to the heat of the sun, (iii) they bled much when cut or lacerated and healed with difficulty. Bissell could not beyond lessened perspiration and cutaneous sensitiveness (which, as far as the sun is concerned, the leucodermatous share with the albinotic) find that any single function of the system had suffered any derangement in consequence of the skin change². The "pigmentum nigrum" had undergone only the usual senile change and the hair had become only moderately gray; the eye had simply the dim cloudy appearance of the eyes of old people and the vision had remained good until 80 years of age. Adams stated that he had never been afflicted in his life with any skin disease but the itch and that but once or twice; further he said that his complexion was much darker than was common among those of his race so that he

¹ See Bibl. No. 571.

² In the case of the Englishman S., noted on p. 210, there has been (i) no observed difference in the perspiration of the affected and normal areas, and (ii) cuts produced while shaving heal as readily on the affected as on the normal areas.

"was a very black Indian." No similar cases nor any albinos were found by Bissell in this tribe, in neighbouring tribes, or among the Indians of this latitude.

Hrdlička, in his *Medical Observations among the Indians* (see Bibl. No. 567), reports that he saw a case of vitiligo in a male Papago aged 55, and four full-blood Mohave girls at Fort Mohave School with "lighter but not quite vitiligo-like spots on the exposed portions of the otherwise normal-looking skin." It is a pity that he has not more closely described these appearances nor defined what he understands by vitiligo. It is not possible to be confident that we have here further instances of leucoderma in the North American Indian.

Leucoderma in the Negro. Leucoderma was first noticed in the negro; the Ethiopian changing his skin came as a startling fact to the knowledge of the slave-owning nations, who based their justification of human slavery largely on a permanent difference in colour. More than one would-be negro benefactor proposed to achieve by drugs what leucoderma was observed to do slowly and partially, and thus remove the bondage of colour¹. The negro changing colour appealed as much if not more than the white negro to the imagination of the 17th and 18th centuries. There are for two centuries fairly full accounts of leucodermatous negroes, although till at least as late as 1860, no clear distinction was made between partial albinism and progressive leucoderma. We have endeavoured to differentiate the two classes of cases, although it is just possible that some of those we treat as piebalds were really leucodermatous.

Case I. *Byrd's Case*², 1698. "An Account of a Negro Boy that is dappel'd in several places of his Body with white spots." This account runs as follows:

There is now in England, in Possession of Capt. Charles Wager, a Negro-Boy, of about eleven years Old, who was born in the upper Parts of Rappahanock River in Virginia. His Father and Mother were both perfect Negroes and Servants to Major Taylor, a Gentleman of the Country. This Boy till he became Three Years Old³, was in all Respects, like Other Black Children, and then without having any Distemper, began to have several little White Specks in his Neck and upon his Breast, which with his Age, have since been observed to increase very much both in Number and Bigness, so that now from the upper part of his Neck (where some of his Wool has already turned white) down to his Knees he is everywhere dappel'd with White Spots, some of which are broader than the Palm of a Man's Hand and others are smaller in Proportion. The Spots are wonderfully White, at least equal to the Skin of the fairest Lady and have Advantage in this, that they are not able to be Tann'd. But they are I think of a Paler White, and do not show Flesh and Blood so lively through them as the Skin of White People, but

¹ See for example Rush, Bibl. No. 128.

² See Bibl. No. 43.

³ Onset at a still earlier age is recorded by James Greenwood (in *Curiosities of Savage Life*, London, 1865, Vol. I. p. 20): "A certain Cree baby was born strong and healthy and to all appearances as like other Cree babies as could be desired. In the course of a year or so, however, it began to change colour, not wholly but in patches, which were of a pinky-white hue. Such a case was without precedent, and there was some difficulty as to how it should be treated, especially as the mother of the child was the daughter of a strong chief...The 'Grand Medicine' or priest was finally consulted, and after hearing the particulars of the affair, he returned a verdict of death against the little Cree boy, sagely arguing that a child who was neither one thing nor the other in colour, would certainly grow up to be neither one thing nor the other in heart; that such a one would probably be a traitor, or to put it at the mildest, could not possibly make either a brave warrior or a trustworthy councillor, and that therefore it would be better to put him out of the world at once."

possibly the reason of that may be, because the Skin of a Negro is much thicker. This Boy never had any Sickness but has all along been very sprightly and active and has more Ingenuity too than is common to that Generation. His Spots grow continually larger and larger and 'tis possible if he lives, he may in time become all over White; but his Face, Arms and Legs are perfectly Black.

This first, we think, recorded case of leucoderma in a negro is of much interest as indicating (i) the early age of onset, three years, (ii) that the most exposed parts, face and arms, did not start first, (iii) that exactly as in albinism and as in European leucodermatous subjects, the skin does not tan, (iv) that the wool on the patches turned white, (v) that no shock or illness is suggested as starting the attack.

Case II. *Bate's Case*¹, 1760. An account of the Remarkable Alteration of Colour in a Negro Woman. In a letter to the Rev. Mr Alexander Williamson of Maryland, from Mr James Bate, Surgeon in that Province, communicated by Alexander Russel, M.D., F.R.S. Russel says that he has had the information of Dr Bate confirmed by two gentlemen now (1759) in England who have seen the woman. The case has been cited as that of Mr Barnes' cook.

Bate says that the negro woman was a cook to Mr Barnes of Virginia and a native of the place, 40 years of age, remarkably healthy and originally having a skin as dark as any African's. About 15 years ago (*i.e.* at age 25) the membrane near the finger nails became white, her mouth soon became white also, and the phenomenon extended gradually all over the body, so that at the present time four-fifths of the surface is white, smooth and transparent as in any European; the parts remaining sooty daily losing their blackness. The neck and back along the vertebrae maintain their primitive colour most, the limbs, face, head, breast and belly are white; the pudenda and axillae parti-coloured, the skin in these parts being covered with white hair, and where dark with black hair. The fair parts glow with blushes when she is excited, ashamed, etc. The woman says that, excepting about seventeen years ago when she had a child, she has never had any complaint of 24 hours' continuance; she has never suffered from any disorder or applied any external applications. She perspires equally freely from the white and black parts. This case is one that began fairly late in life (25) and the equality of the perspiration from white and black parts is directly opposed to the statement of Bissell with regard to his leucodermatous N.A. Indian (see our p. 215). The occupation of the woman is also to be borne in mind having regard to some later records and the suggestion as to lime in Duncan's Bengalee (see our p. 214).

Case III. *Jefferson's Case*², 1787. Jefferson in his *Notes on the State of Virginia*, refers to a pied negro. He was born black of black parents, but when a boy³ a white spot appeared on his chin. "This continued to increase until he became a man, by which time it had extended over his chin, lips, one cheek, the under jaw and neck on that side. It is of the albino white, without any mixture of red,

¹ See Bibl. No. 63.

² See Bibl. No. 102, p. 120.

³ The *Gazette hebdom.* 1860, p. 44, converts this into "in his infancy," and Simon in his Case 21 modifies to "first year of life."

and has for several years been stationary. He is robust and healthy, and the change of colour was not accompanied with any sensible disease either general or topical."

This instance started like Case I in childhood and the *stationary* character is noteworthy, when we have to consider whether other piebalds were, or were not, congenital.

Case IV. *Rayer's Case*¹. This is that of Colonel Filcombe's negro. This negro was scalded in several parts of the body in handling a cauldron of sugar. In these parts his skin on recovery became white and this whiteness spread little by little to other parts, even till it rendered him everywhere as white as the English. This white skin was very tender. Cf. Hutchinson's Case (p. 212), where the leucosis is said to have begun at the seat of a blister.

Case V. *Fisher's Case*², 1794. Fisher published his account in 1798; Dr Benjamin Rush had seen Henry Moss, this negro, about 1792, and briefly refers to him in a paper published in 1799. Rush says (1792) that he began to change about five years before, starting at his finger nails and extending over the greater part of his body, the wool also changing. Fisher says the back of neck, breast, arms and legs were white in 1794, interspersed with small specks of African colour "not unlike the freckles which appear on the skin of a fair woman in summer." He had a streak of white about 1" broad and elsewhere 2" on his face of perfectly European complexion. The whole area of black skin left was not a square foot. Fisher saw the man again after an interval of a month and found that "the black parts had sensibly diminished." So far there is nothing of special interest in this case, but if the reader will turn to Fig. 503, he will at once see that the pedigree is a remarkable one. The maternal and paternal grandfathers were African negroes, but the maternal grandmother was an Irish woman and the paternal grandmother a North American Indian. There is some evidence for supposing that leucoderma and even albinism may occur as a result of pigmentation upset following hybridisation.

We suspect that the account given in 1819 by Dr J. V. Wiesenthal³ of a

¹ *Histoire des Voyages*, T. xv. p. 614. Also Rayer, Bibl. No. 179, II. p. 193, Case v. Pepys tells a tale of Darnford, a negro, who scalded his beard with mince-pie, and it came up again all white in that place and continued to his dying day (*Diary*, Oct. 9, 1660). Hammer reports the case of a negro aged 16, who was bitten by a dog, and, within the space of 25 days after, his black colouring grew markedly paler, and his skin became covered with white spots, which increasing left him at 25 with a body as white as that of a European, but speckled with black dots. He married a negress and had normal children (see Bibl. No. 415).

² See Bibl. Nos. 127 and 128. We are in doubt as to whether the case described by De la Rochefoucault Liancourt (*Travels through the United States of North America...*, Vol. II. pp. 133—4, London, 1799, trans. by H. Newman) is also Henry Moss. He saw at Philadelphia a Virginian negro who exhibited himself about the country, and, noticing that cases of going white occur among Negroes, Mulattoes and Indians, he says that this case is very remarkable on account of its being so extended. He says that the neck and shoulders were of the same complexion as the skin of people with red hair, and were freckled in the same manner. He further remarks that straight and smooth hair was replacing the natural wool. The account tallies at some points, but not all, with that of Henry Moss.

³ See Bibl. No. 163.

negro he had seen in Baltimore in 1814 also refers to Henry Moss. He entitled his paper: *Case of a Negro whose skin has become white*, and it is interesting to see the progress made in 20 years. Henry Moss, if it was he, is still on exhibition and he must have got into the habit of saying that the change had taken four or five years (Fisher says four years before he saw him, Rush who saw him two years *earlier* says five years and Wiesenthal, who saw him 20 years after Fisher, says four years!). Otherwise Wiesenthal's account is in accordance with and supplementary to Fisher's and Rush's. Wiesenthal writes that he saw:

"a negro man whose skin has nearly lost its native colour and become perfectly white. This man is nearly 58 years of age. His grandfathers were both native Africans; his paternal grandmother was an Indian, the other grandmother a white woman. The original colour of his skin was a dark tawny, as our native negroes commonly are. This wonderful change commenced about four years previous to the time I saw him, and first appeared at the roots of the finger nails, from whence it extended gradually to about the distance of an inch and there stopped. It next began on the neck, and this went on through the surface of the body and lower extremities, which are now entirely white except some part of the feet and a few slight freckles on the breast. The arms are entirely changed, as are the hands, except a small part on the back of them. The face and scalp are entirely white, the hair has undergone some alteration. It is grey like that of an old man, and though it still retains an African character, short, curled and strong, there are evident appearances of a disposition to become straight, long and soft as in the whites¹. The altered skin has not the softness, nor appearance of the whites, but is free from any red colour and of a deathlike hue....The only parts which retain any of the original colour are the back of the hands, and the upper surface of the feet."

We do not reproduce Wiesenthal's statement as to the manner in which the change takes place, because he was evidently under the impression that Moss had only exhibited himself for a few years, during which the change had been very rapid. Nor need we consider his theory of the secretory processes by which the loss had arisen. The main points are that he confirms 20 years later the earlier accounts, and further that the change to not quite complete whiteness must have taken between 20 and 30 years. In the face of this, too much stress must not be laid on Fisher's statement that he saw change in a month, unless we have to suppose that he saw Moss at a time when the rate of depigmentation much exceeded the average.

Case VI. *Dancer's Case*², 1802. This was that of Charles Fuller, a negro between 50 and 60 years of age, born in the West Indies and belonging to the Middleton estate in St Thomas in the East. He had a slight fever, and on recovery several white spots appeared on his face, which spreading and running into each other, his whole face became like that of a white man except for three or four blotches (Dancer gives an engraving). "The man is in perfect good health, having no symptom of any disease except a slight oedema or swelling of the ankles, to which he has long been occasionally subject." The same white spots

¹ There is certainly no differentiation of this kind in the hair of negro albinos or *piebalds* in our possession, but it has been asserted in some other records.

² Case of a negro turning white, communicated by Mr T. Dancer of Kingston, Jamaica. *Medical and Physical Journal*, Vol. VIII. p. 97, London, 1802.

began to appear on neck, arms and trunk, and in a short time "the Ethiopian may become white." He had been for many years a hot-house doctor, *i.e.* an attendant on the sick in a plantation hospital, and had undergone no alteration in his habits of life, nor had he been under any mental depression, except that produced by his change of colour. "The colour is a healthy ruddy white, not that of an Albino, nor does he labour under any defect of vision as all the Albinoes do."

Case VII. *J. Brown's Case*¹, 1824. This case, of some interest because it was fairly carefully watched for nearly six months, is of interest because its origin appears fairly definite. Samuel Herd, a negro of Dominica, aged 50, had an operation in January 1818, from which he perfectly recovered. Many months after (April 1819) he came "for something for his skin," as it was becoming white and other negroes laughed at him. After the healing of the operation wound the cicatrix remained white, and much about the same time other parts became white also, especially the hands and feet. Whitening began on back of hand, gradually extending up fore-arm; the same process was (April 1819) going on in lower extremities; feet, legs, thighs and hips now almost all white; some white spots on back and shoulder and about half breast is of same colour; broad white ring round penis and a considerable part of the scrotum is affected. June 10, 1819, head nearly white and seen shining through dark curly hair; a large white spot has appeared on lower part of abdomen; half the penis has changed colour; has occasional paroxysms of asthma. September 10, 1819, change less rapid; skin acquiring more natural appearance; on comparison of his hand with that of a sunburnt white, it could not be distinguished; perfect health. May 1820, progress very obvious; lower extremities almost a natural white excepting patches of bluish tint; hands and arms entirely white; skin on shoulders and breast pale ash colour; head completely white; hair black woolly; ears, eyelids, and skin round eyes, forehead and *alae nasi* changing fast; lips bright vermilion colour; breast, abdomen and back, speckled, skin on back which has not changed is black and shining. September 22, 1820, continues to change. It is a misfortune that this case was not reported later; it would have been of much value to know whether the hair finally became white; there appear to be other cases in which the hair has not changed; the rate of change seems to have been far quicker than in Case V. It is also worthy of note that change began on back of the hand, a place which remained after 20 years' progress of the disease the normal colour in Case V.²

After Brown's paper of 1824, there is little to note until the publication of a paper on partial albinism by Th. Simon in 1861³. He records 22 negro cases, but he mixes up leucoderma with congenital piebaldism⁴. Besides the historic cases

¹ See Bibl. No. 183.

² Brown's paper also refers to the case of a female aged 30 in perfect health, whose change in six years was far less rapid than Herd's. She had been seen by Dr Pritchard in Demerara (*Notes on the West Indies*, Letter 29). The writer of the paper says that he only knew of six recorded like cases and that three of these occurred in childhood.

³ See Bibl. No. 282.

⁴ Simon notes that beyond doubt *Albinismus partialis* is not the aetiological factor in all the cases he has recorded.

of leucoderma in negroes, that we have already discussed above, he mentions five cases which are clearly leucoderma and not partial albinism; Simon seems to have taken his particulars from a French journal¹, the originals being inaccessible to him as to us. We give a list of these cases in a footnote², as it may interest some of our American readers to see whether they add anything to the cases we cite above and below.

Case VIII. *Sir Richard Burton's Case*, 1863. This case is not very fully described by Sir Richard Burton himself. A somewhat poor reproduction was published by Beigel³, who gave the original photographs to Sir Jonathan Hutchinson, who presented them to E. Nettleship in 1870 or 1871, and from these our Plate B has been prepared. Sir Richard, then Captain, Burton writes⁴: "In front of a hut in Accra sat a strange individual, a piebald man, as he is described in ethnological and dermatological works. The greater part of his skin appears to be dirty white, the rest is made up of a series of dark coloured spots. A few years ago the man was a negro, but was turned gradually into a white man, and when we saw him the rete mucosum seemed to be returning again to the normal."

If we were to trust implicitly Burton's account, the black patches as in Reinhard's case had begun to increase, but the evidence is not definite enough. The interesting points in the case are the white flare on the forehead and white comb, which as a rule are more noteworthy in congenital cases of partial albinism than in leucoderma.

Case IX. *Smester's Case*⁵, 1879. This was a negress of Haïti, who was occupied as a *laundress*. She was born of black parents, had black children and grandchildren, and remained herself black till between 30 and 35 years of age. She then became wholly white except for some small spots on the body. Her face became "blanc mat" like the tint of white women who have been a long time, or have been born, in the tropics. She had some black spots upon certain parts of her face. Her hair had begun to grow markedly gray; her eyelashes and eyebrows were almost white. The areola was rose as in white women, who alone show this purity⁶. All the spots like *i*-dots together would not cover more than the size of

¹ Albinisme...chez les nègres. Newsom and Dowler, *Gazette hebdom.* Janv. 1860.

² *Simon's Case* 17 = Joseph Daniel, slave in Kentucky, aged 43, born of black parents, onset at 14, and said to be stationary from 23, *i.e.* for 20 years. *Medical Chirurgical Journal of St Louis*, 1853, No. 1.

Simon's Case 18 = Newsom-Dowler Case. A Mississippi State negro, onset after a four months' illness at 34. *Original?*

Simon's Case 19 = Newsom-Dowler Case. Negro slave, clearly extreme leucoderma. *Original?*

Simon's Case 20 = Newsom-Dowler Case. Negro, head and extremities attacked in 18 months, body also. *Original?*

Simon's Case 22 = Newsom-Dowler Case. Tom Clinton, negro, 60 years old, who was fully black till 46. *Original?*

³ See Bibl. No. 310.

⁴ See Bibl. No. 293.

⁵ See Bibl. No. 262.

⁶ On an areola in a pregnant albino woman remaining delicate pink, Montgomery's second areola not being developed: see Bibl. No. 261.

the hand. The depigmentation had occupied 12 to 15 years; she had had good health and was active and intelligent. There was no trace of syphilis. She had seven sons and four daughters, of whom one son and four daughters were living; all were black—two strong black daughters were seen—as well as the grandchildren. Smester says that several were born before she grew white, so presumably some were born later. What makes this case noteworthy is the remark of Smester already cited on p. 203, that the retina had begun to lose its pigmentation and the eyes to be photophobic. Smester makes the remark without any apparent hesitation, but it is so unique in leucoderma cases that we are compelled to suspend our judgment. The photophobia might possibly have another origin; it is to be noted that eyelashes and skin of face and presumably eyelids were leucotic.

Case X. *Maas' Case*¹. In 1892 Maas showed a "Tigermenschen" to the Berlin Anthropological Society. This negro was born in Cape Town and in 1892 was aged 19. He had spots of white and a comb of white hair down the centre of his head. It was said to have come on when he was five years of age. The skin was softer and more delicate where white than elsewhere. The case is very briefly described and we should have supposed it to be a case like our partial albinos in Plate RR. Virchow compared it with a white comb case in a young German *Gelehrte* of his acquaintance, which was almost certainly congenital. This case, Burton's Case and the very doubtful "Leopard Family" of Gould and Pyle (see our p. 203) are among those which prevent us from dogmatically stating that the flare and comb form of leucosis is peculiar to partial albinism².

Case XI. *Reinhard's Case*³, 1897. We have already referred to this case—the negro schoolmaster in the suburb of Pretoria (see our p. 201)—as especially remarkable for the manner in which depigmentation was followed by repigmentation. (143) and (144), Plate QQ, show a depigmented state of the face and the later repigmented stage.

Case XII. *Ward's Case*⁴, 1906. This case of leucoderma in a Zulu is best described graphically by the photographs on our Plate C (6) and (7). The body appears to have been attacked before the head and the symmetry, far from marked, is only rudely bilateral. The whitened areas are as usual interspersed with smaller ones and often interrupted by islets of still normal skin. It is to be noted that the head and neck have so far escaped. The leucosis is much more abundant on the front of the trunk than the back. Its duration was not stated.

Case XIII. *Sandwith's Case*⁵, 1905. This case of leucoderma in a Sudanese is given on Plate C (8). Both hands have been affected and the symmetry on the back is very considerable.

¹ See Bibl. No. 438.

² Stelwagon gives a picture of leucoderma apparently in a brunette, which shows symmetrical bleaching of the eyelids and neighbourhood, leaving a *large nearly median patch of forehead normal*. He emphasises the neighbourhood of the eyes as a not infrequent site. Cf. also Plate D (9).

³ See Bibl. No. 472.

⁴ Letter to E. Nettleship, 1907.

⁵ Letter to E. Nettleship, Aug. 1, 1905.

Case XIV. *Turner's Case*¹, 1908. Dr G. A. Turner sends us particulars of this case, a Shangaan named Mazumbome (No. 28180 W. N. L. A.) aged 25. This is of special interest because it marks a unilateral case in the negro, similar to Nettleship's English unilateral case (see p. 203 ftn.). He had white hair sprinkled over the left side of the head freely, especially over the parietal region; the right side of the head was quite black. Whiskers on the left side of the face were quite white, those on the right side black. The beard was white on the left side, a few white hairs extended from the left side of the chin just overlapping the middle line. There was a small patch of leucoderma over the left eye, and another on the left side of the chin. The rest of the body was quite black. The "boy" appeared in good health and was well developed.

Case XV. *Maynard's Case*², 1910. This is another very interesting case of unilateral leucoderma. The negro, aged about 35, belongs to M'suto race. He has never suffered from any severe illness, and has been at work with the same master, who confirms his story, for 3½ years. Just before Christmas, 1908, the leucosis suddenly appeared. He states that he went to bed quite well with no discoloration of the skin; when he got up next morning he had the white spots as they now appear (Plate QQ (145) and (146)), and nothing will make him alter this statement, which his master corroborates. He was not ill and went to work as usual. The condition is said not to have altered from that date, either in extent or condition of pigmentation. The leucotic patches are strictly unilateral; in the dorsal view it appears as if some spots were on the right of the middle line, but this is not so. The distribution is shown in the two photographs. The patches vary considerably in respect to absence of pigmentation, those on the neck, face, and over the upper part of the sternum being almost completely devoid of pigment, the hair growing in these areas being quite white. From complete absence of pigment, the spots show marked gradations, those over the deltoid being intermediate in colour between the face spots and the large area over the pectoralis major, to the axillary side and above the nipple. These maculae are just observable in the photograph. The darker areas appear as if pigment might be returning into areas which had once been devoid of colour. This the man denies and is positive this difference in shading was present from the first day. There is no increase of pigmentation at the edges of the lighter areas³. There was no family history of leucoderma. Asked what his relatives said when they saw the spots, he replied that they had never seen the condition before, nor had they heard of a similar case. Asked what they called it, he said: "We have no native name for it." Further cross examination failed to elicit anything further, so that it is very unlikely there was any relative affected or that leucoderma was

¹ Letter to C. H. Usher dated Johannesburg, Oct. 16, 1908.

² Letter to K. Pearson dated Pretoria, Jan. 22, 1910.

³ Dr Maynard also obtained the history from the man in his own language through the Native Commissioner of the District, and the replies were the same as those he had himself obtained in Cape Dutch.

known in the "boy's" native district. Of his known relatives, father and mother are both dead; his father had brothers and sisters, exact number unknown; his mother three sisters. He himself was second of a family of six, 1st, 3rd and 6th females, 4th and 5th males. He has two children, elder boy three years, younger a girl two years old. Within the above range of relationship, he is sure no like case has occurred.

It would be impossible to table all the reported modern cases of leucoderma in the negro. We have selected the earlier of the above instances because they are famous cases, which were not without influence on white feeling with regard to the negro. The later cases have been chosen because they suggest in one direction or another important points which need clearing up, or because we were in possession of good illustrative photographs representing racial varieties. For those who may wish to consider the matter further, we may refer to a series of nine photographs taken at Lagos by J. H. Jeans, and presented, July 1872, to the Royal College of Surgeons, London (Dermatological Section, 139, single mount of nine figures entitled: *Leucasmus-Achroma*). They are described as nine photographs of "piebald negroes whose parents were negroes¹."

A point which deserves further study in respect to negro leucoderma is the possibility that the skin change in some cases is xanthous and not albinotic, *i.e.* that as we can have an incomplete albinism so we may have an incomplete leucoderma. Klinkosch² speaks of negroes becoming not white but yellow through disease, and Caldani³ records the case of a negro, a shoemaker in Venice, who lost his dark colour as he grew older and ended with having the same colour as a white with a mild attack of jaundice. Joseph Jones and others have also noticed *yellow* spots in cases of leucoderma: see our p. 205. It must, however, be admitted that these cases are very rare, and it is not certain that they are really to be looked upon as an incomplete form of leucoderma. They would undoubtedly be of

¹ Figs. 1 and 4. Front and back view of negro, age 40; nothing to distinguish from ordinary leucoderma. Figs. 2 and 5. Front and back view of another adult negro; less extensive white patches apparently rather more on L. side; resembles ordinary leucoderma except for a large broad "flare" from halfway down the forehead back nearly to occiput and about as broad as the eyes are apart. Figs. 3 and 6. Front and back view of adult negress; very extensive leucoderma of trunk and limbs, and around mouth, but scalp and upper face entirely unaffected. Figs. 7 and 9. Front and back view of a lower type negress than the previous one, with more general but less defined leucoderma. Fig. 8. "A young albino negress; the achroma is general and complete; her eyes were brown." With the possible exception of Figs. 2 and 5 (and of course Fig. 8), these should be described as leucoderma rather than piebald cases.

² "Multum etiam per morbus mutatur color. Albae sunt cutis cicatrices nigris, & post variolas, lente demum per flavorem in nigredinem transeunt. Nigritae ex morbis etiam lutei fiunt, qualem his Pragmae vidimus." *Dissertationes Medicae selectiores Pragenses*, 1775, Vol. I. p. 325.

³ "Neque obstare videtur, in temperatis & frigidis etiam, ut contendunt, regionibus, proprium Aethiopes servare colorem; nam primum hoc certum non est; & sutor de hac gente adhuc Venetiis vivit cujus nigrudo longo annorum intervallo (puer enim ad has oras appulit) ita sensim imminuta est, ut leni ictero laborare videatur." *Institutiones Physiologicae et Pathologicae*, ed. Eduardus Sandifort, 1784, Vol. I. p. 171.

much interest if they were studied and verified as leucoderma. This incomplete leucoderma might ultimately throw light on the nature of xanthism, as complete leucoderma will no doubt one day throw light on albinism.

If we sum up the results to be reached from the above cases of leucoderma, we are forced to admit that they are rather negative than positive. The onset may occur in the earliest years of life, or only after middle age; the progress of the leucosis may be rapid or very slow, it may be intermittent or continuous; it is impossible to say that it usually starts in one or another tract; sometimes the hair appears to be affected, sometimes not; the distribution of the patches may be symmetrical, but it may not, and quite unilateral cases are known; it does not appear in character or distribution to be different in one race from a second; although in some cases it appears to be started by a burn or a wound¹, or possibly associated with a trade, cooking, laundry, sugar refinery work, mortar-mixing, yet this is far from universally the case; further, when apparently started by a burn or wound, the loss of pigment leaves the skin of quite a different character from that observable in the cicatrix of a wound. In some cases it seems to follow an illness or fever. Again, in other cases the hereditary factor seems to play a part. If a specially nervous constitution be markedly correlated with the leucodermatous tendency, it must not be forgotten that this association is not inconspicuous in the case of albinism itself. As far as we know at present—excluding cases of inflammatory vitiligo—there is no differential physiological feature observable between skin or hair of leucodermatous and partially albinotic individuals; and the cases in which a pigment loss in the eyes of either has been asserted, rest on equally slender evidence. We shall, before the conclusion of the next chapter, discuss whether there is any feature of the distribution of the patches which will serve as a criterion between leucoderma and partial albinism.

¹ Hutchinson records a case where it was stated to have arisen from a blister (see our p. 212), but of 50 cases seen by 1870, he notes excellent health in many and no origin discoverable. (*New Sydenham Society's Atlas Descriptive Catalogue*, Part I. pp. 36—37.)

CHAPTER VI.

PARTIAL ALBINISM.

A. *Piebalds.*

WE have already indicated that we know no physiological differentiation between the elements of skin of a leucodermatous person and an albino; we shall discuss later possibilities of difference in arrangement of leucotic patches. The sole guide we have really to distinguish a case of partial albinism from one of leucoderma is the past history¹; and in this two points of difficulty arise. The eyes being unaffected, and possibly the hair also, the whole matter turns on observation of the skin. But the skin is not sufficiently pigmented in the first months of life, for partial albinism to be at once and certainly observed in white persons. Further, the unpigmented areas will naturally grow in *absolute* size, but not in necessarily *relative* size. Thus questions put without great care to the semi-ignorant², may lead to true cases of partial albinism being classed as leucoderma. The spots will not be noticeable at birth and will grow in size. Hence it is quite conceivable that some cases of leucoderma, stated to have started in earlier years, are really cases of partial albinism. On the other hand, there is evidence that leucoderma does in some cases start early in life, and that it may become temporarily or even permanently stationary. It is thus possible that some of the pied negroes used for exhibition purposes have really been leucodermatous and not albinotic. In the cases as they arise, we can only judge on the particular evidence, and we frankly confess that we are not convinced of its sufficiency in all the cases we have given above as leucodermatous, or in those to follow as albinotic. The importance of this qualification is to be borne in mind if any attempt be made on the basis of distribution to differentiate albinism and leucoderma by consideration of the above cases. For example, we are by no means confident that Gould and Pyle's Case (see our p. 203) is not really partial albinism, and some of the early European piebalds may possibly be cases of leucoderma. When we commenced this subject

¹ Simonot (see Bibl. No. 281) discusses without any finality this very problem of whether an observed individual with leucosis is, or is not, a congenital case. The fact that the past history is the only clue known at present to distinguish leucoderma and partial albinism is very full of significance. We have already noted that Crocker's three diagnostic characteristics of leucoderma will *not* in every case suffice for differentiation; see our p. 199.

² For example: When were the spots noticed?—Between two and three years of age. Did they grow in size? Yes; would be questions and answers quite insufficient to differentiate leucoderma and partial albinism.

of partial albinism, we had before us the recorded, chiefly negro, cases. It was soon obvious that none of these negro cases were of a recent date, and it seemed desirable to search for more modern examples of piebaldism. For this purpose, circulars and personal letters were sent to medical men in the United States and in the West Indies, as to congenital partial albinism. While those who replied had seen negro albinos and cases of negro leucoderma, they were, with one exception, agreed that they had come across no congenital piebalds¹. Notwithstanding this weight of evidence, which at least shows that the true pied negro must be very rare at the present time, we can hardly in the face of Seligmann's Papuan case, Gilbert Smith's English case and the Nyassaland Family, doubt the existence of extensive piebalds at the present day. Further, we have evidence of congenital and hereditary cases of white patches seen by the medical men of to-day. These may range from a small white spot or tiny lock of white hair, to patches covering quite a large area of face or body, until it is somewhat difficult to say that the individual is not pied. These minor cases, however, are quite distinct from the pied—as distinct as a horse with white markings is from a piebald horse. It is convenient to have a name for this class of splashed or spotted individuals, and we propose to call them *spotlings*. The spotling is relatively common, probably nearly as frequent as, if not quite as frequent as, the complete albino²; the piebald is rare,

¹ Drs George M. Gould and J. F. Shamberg of Philadelphia had never encountered a piebald person; Drs N. Senn and G. Chalmers Da Costa of Chicago had never seen a piebald negro; Dr Rudolph Matas of New Orleans had never seen a true congenital piebald negro. Dr H. Dickson Bruns of New Orleans, who sees over 1000 negroes yearly in his clinic, has nothing but "quite common" cases of leucoderma in negroes and mulattoes to report. Dr J. Dyer of New Orleans had only seen complete albinos; he writes "I have some photographs of a coloured girl at twelve, in whom the general arrangement of the spots of leucoderma would argue long duration, but I did not consider the statement of the parent clear enough to be accepted with all credulity" (Letter, Dec. 27, 1907). Dr M. H. Post of St Louis also had met with none. Thirty-seven medical men—distributed over Jamaica, Trinidad, Grenada, Antigua, St Vincent, Bahamas, St Lucia, Montserrat, Dominica, St Kitts, San Domingo and Barbadoes—could provide no case of congenital piebalds, although we owe to them several of our albino pedigrees, and some of them reported leucoderma. Dr C. A. H. Thurnam of Falmouth, Jamaica, could only hear of one case which approached this condition from enquiry among those living many years in that part of the island, but efforts to trace the lad or his parents were unsuccessful. Our one exception is Dr L. A. Duhring of Philadelphia. He writes in his *Practical Treatise on Diseases of the Skin*, 2nd ed. 1881, p. 399, that pied negroes "are not rare in our Southern States." In a letter to E. Nettleship (Nov. 19, 1906), Dr Duhring maintains this view: "Cases of piebald negroes as occurring everywhere in the negro race are not very rare, and examples with photographs are occasionally published in the medical journals. Some are congenital, others acquired. I have observed them from time to time, but have not given the subject special study." Dr H. G. Piffard of New York, author of a well-known American *Treatise on Diseases of the Skin*, 1896, states that he has never seen a case of congenital partial albinism; in all the spotted cases of whites and blacks he has seen "the condition appeared later or was progressive." (Letter to E. Nettleship, Oct. 28, 1906, with a photograph of "Leopard Boy" exhibited at Barnum's Circus.) Further, not one of our African correspondents has seen a piebald of the extensive pattern of the old records, though we have evidence of many congenital white patches.

² Our statistics show the complete and incomplete albino in the ratio of 2 to 1 roughly, but lesser phases of leucosis readily escape even a specially directed enquiry.

far rarer than the complete albino. He is probably rarer than he even appears from the older records, because (i) some of the cases recorded by different authors are possibly the same—no names being preserved, and (ii) possibly some of them were actually leucoderma. We shall deal first with the piebalds under the two headings of *Coloured Piebalds* and *White Piebalds*, and then with the spotlings under the two headings of *White Spotlings* and *Coloured Spotlings*. We do not assume that there is any essential difference, beyond extent of unpigmented area, between the piebald and the spotling groups, and some few cases are almost intermediates. We have already noted that albinotic members of dark skinned races often present a number of dark brown spots chiefly on the front and back of the trunk. These are referred to by many writers, and we have spoken of such albinos as spotted albinos (see our pp. 54—7 and our Plates V and Y). These maculae appear to arise several years after birth, and probably owing to exposure to the sun. Such spots are not large enough to justify the term pied, and they are very distinct in character from what we understand by congenital piebaldness. These spotted albinos are also wholly different from our spotling,—the human being with leucotic markings. Still it is quite conceivable that some writers have confused the spotted albino with the pied individual, and wrongly given the name of piebald to an albino proper. Thus Raffenel¹ in 1844 describes an albino, the surface of whose skin was covered with symmetrical black spots as *l'homme pie de Cuvier*, but we suspect he was only one of our spotted albinos, and Baudoin's cases of the negroes at Tahibet (see our p. 125) *with red eyes*, yet spotted black and white like a chequer board, were probably of this class and not pied individuals. An apparently transitional case from the piebald to the spotted albino is that of Dr Turner, described on our pp. 116, 258.

Coloured Piebalds.

The earliest cases of piebalds that we have met with in history are those of Ptolemy and Apollonius, although we cannot be certain that they were not leucodermatous.

Case (1). *Ptolemy's Case.* Lucian² tells us that: "Ptolemy the son of Lagus [B.C. 323—285] once brought with him to Aegypt from the East, two strange things, a bactrian camel perfectly black and a man one half coal-black, and the other half snow-white³. After several other shows had been exhibited to the Aegyptians in the theatre, he caused the camel and the half white man to be produced, and he doubted not that they would be most agreeably surprised at so novel a sight. But it fell out just the contrary. Notwithstanding the camel was decked all over with gold, and paraded with purple trappings and a bridel inlaid

¹ See Bibl. No. 259.

² See Bibl. No. 8.

³ Tooke (Vol. II. p. 624, London, 1820), whose translation we have followed above, does not seem to give the true sense of the Greek: καὶ δίχρωμον ἄνθρωπον ὡς τὸ μὲν ἡμίτομον αὐτοῦ ἀκριβῶς μέλαν εἶναι, τὸ δ' ἕτερον, ἐς ὑπερβολὴν λευκὸν, ἐπίσης δὲ μεμερισμένον: the latter words might indicate equality of amount of colours without bilateral division, such as Tooke's words suggest.

with precious stones, which probably had belonged to some Darius, Cambyses or Cyrus, the crowd were struck at the first sight of him with such a panic that they suddenly started up, and were on the point of running away. But when the black and white man appeared, most of them burst out into violent laughter, and the rest were struck with horror, as if they beheld a prodigy of mischievous portent. So that Ptolemaeus, on perceiving that there was not much honour to be got by them, and that the Aegyptians made little account of objects for their novelty, but preferred beauty in forms and proportions far before it, ordered them both to be taken back, and he himself set not so much value on his party coloured man as he had done before. The camel was so neglected that he shortly after died; the man, however, he made a present of to a flute girl, named Thespis, for playing particularly well once while he sat at table."

Case (2). *Apollonius of Tyana's Case*. In Philostratus' life of Apollonius (circa A.D. 44) we find that the latter met a piebald woman in the Punjab: "Hic in mulierculam quoque se incidisse perhibent, a capite vsque ad mammas nigram, a mammis vero ad pedes vsque albam totam. Atque se quidam quasi spectro oblato fugam arripuisse, Apollonium vero manum mulierculae porrexisse, quae esset, gnarum. Talis nempe Indicae Veneri sacra est, nasciturque Diuae varii coloris femina, sicut Apis apud Aegyptios." This dedication of piebalds to the "Indian Venus" or the Egyptian Apis, if correct, seems to have escaped record. Neither the case of Ptolemy nor that of Apollonius suggests a distribution of patches similar to that arising from leucoderma, even if we lay in the latter case no stress on the words "born to the goddess²." The case is interesting as it is one of the only two Indian piebalds we have heard of, both unfortunately very incompletely recorded³.

We now turn to the historical negro cases which first brought partial albinism into notice.

Case (3). *Gumilla's Case, Maria Sabina*. Gumilla⁴, a priest in charge of the Jesuit College at "Cartagena of the Indies" (*i.e.* in Colombia), writing about 1743,

¹ Philostratus, *De Vita Apollonii Tyanensis*, Lib. III. Cap. 3, ed. G. Olearius, Lipsiae, 1719, p. 96.

² A cloistered commentator on this passage, who had clearly never heard of piebalds or leucoderma, after citing Ctesias (see p. 15) on the "whites" of India, continues that neither Ctesias nor any one else has reported a monster like this, and that without doubt she was a work of art. She was a woman *ex albis*, who for the sake of deceiving the populace had blackened her upper parts!

³ The second case is referred to in a letter from Dr Owen Berkely Hill to K. Pearson (dated Cannanore, Aug. 11, 1909): "I saw a case of partial albinism yesterday in Vellore in a child (Mahomedan ♂) aged seven. The eyelashes were white, the hair of the head yellow, but the skin was only white *in patches*. As I was only passing through Vellore, I had no time to approach the child cautiously with a view of asking him questions. To have attempted a series of interrogations in a hurry would have frightened the child so much that he would probably have become speechless with terror." The description given of eyelashes and hair corresponds to that of a complete albino, not to that of a leucodermatous child of seven; the skin would fit the case of a partial albino, but not that of a complete albino, unless the patches as in some of the negro cases, were freckles or due to dirt. A knowledge of the state of the eyes would be of interest. We hope for further particulars.

⁴ See Bibl. No. 60^a, Edn. 1745.

states that in the year 1738, when visiting the sick employees from the plantation, who were lodged in the adjoining hospital, he found amongst them a married negress, who had not recovered from her confinement of "some six months before¹," whose baby, a girl, presented an appearance so extraordinary that he is afraid his description will be charged with exaggeration, although many careful drawings of the child were afterwards made. He charged the mother to guard the child carefully from curiosity, lest some one should cast the evil eye upon it. That the child was patched with black and white at this date is proved, though not stated in so many words, by the author's detailed account that its colouring closely resembled that of a black and white bitch that the mother had possessed for some time and that was with her during her illness². Gumilla further states that many of the other priests of the College came to "see and wonder at the marvel"; that the ladies of the town were impatient for the mother to recover in order that she might carry the child to their houses for exhibition, and that when they at length saw it, they were fully satisfied, loaded it with ornaments and wished to buy it at any cost; the child, however, as a result of this exhibition began to show signs of fever, and the mother and she were sent back to the plantation. The fame of this piebald spread throughout the district and Gumilla states that the heads of the English factory ("los Cònsules de la Fatoria Inglesa") sent a very characteristic picture of the child to London³. Gumilla wrote about the child, when she was five years old, but he states nothing about any brothers and sisters. In an earlier part⁴ of his work, Gumilla tells us that in "la Hacienda de Majutes" two black slaves before 1738 were the parents of eight offspring, the negress bearing blacks and whites alternately. The whites were of extreme and unpleasant whiteness, and hair yellow as saffron, the blacks negro like their parents. The circumstances were well known to the inhabitants of Cartagena. The Marquis de Villahermosa on resigning his governorship took the first born of these white negroes to the Court of Madrid. Don Dionysio de Alcedo y Herrera, President of Quito, and afterwards of Panama, took the daughter as a present to his wife⁵. Now this is clearly the family recorded by de Pauw (see our Fig. 437), who does not state from where he drew his information, which at some points differs from Gumilla's

¹ Gumilla appears to be wrong in the date, 1738; for Maria Sabina is said (R. College of Surgeons' picture, see Plate SS (151)) to have been born in October, 1736, and could not be about six months old in 1738. He wrote his account, however, much later, when the child was five years old.

² Gumilla himself attributes the piebaldism to maternal impression, and states that the markings on this bitch were identical with those on the child!

³ This would account for the *English* inscription on the picture, but is not consistent with the picture on the *Christian*, being a Spanish picture captured on a Spanish ship by Admiral Frankland. Possibly the English Factors' picture was sent on the Spanish ship, only to be captured by the English and then recaptured by the French. The French translation of Gumilla, on what authority does not appear, asserts that the portrait was painted to send to the Court in London.

⁴ Bibl. 60^a, Edn. 1745, p. 97.

⁵ Gumilla adds that there were actually in Cartagena at that time other *negro albinos*. Further, that negroes from Angola whom he had questioned in Cartagena, assured him that this sort of children were born in Angola without surprising the negroes there.

account, and makes no mention of the normal offspring. Still further difficulty is introduced by the article in Diderot and D'Alembert's *Encyclopédie*, which must have been written about 1765 and before de Pauw's work. The following paragraph occurs: "A man worthy of credit saw at Cartagena in America a negro and negress whose children were white, like those we have just described [*i.e.* albinos] with the exception of one which was white and black, or pied. They belonged to the Jesuits, who designed them for the Queen of Spain." See our Fig. 269. It is difficult to believe that this is de Pauw's case, for he does not refer to any piebald. Again, Gumilla says nothing about his piebald girl being designed for the Queen of Spain, nor does he mention any siblings of his piebald, whether albinos or negroes. If correct, it is of great interest as extending the number of cases in which piebaldism has appeared in the same stock as albinism. Of course it is possible that albinos were born later to the parents of Gumilla's piebald—he wrote about 1743—but the notice in the *Encyclopédie* is isolated and we have no further clue¹.

Another step in this history may now be taken. Parsons, writing in 1765, states that he had heard from a lady who lived several years in Virginia: "That Admiral Franklin had taken a Spanish ship in war time and brought her to Carolina, and on searching had found a picture of a boy beautifully mottled all over with black and white spots, it was uncertain which was the ground and which colour the spots were. Several copies of the picture were taken in Carolina, and they said it was the portrait of a child born of negro parents on the Spanish main; the ship was bound for Spain. The lady did not doubt that the Admiral still had the picture." Now as far as we are aware there never was an Admiral *Franklin* on the West Indies station at this period, but there was a Capt. Thomas *Frankland*, afterwards Admiral Sir Thomas Frankland, who was in command of the *Rose* frigate in 1740 and "was sent out to the Bahamas, on which station, including the coast of Florida and Carolina, he remained till the summer of 1745. During this time he captured several of the enemy's vessels, privateers and guardacostas including one in June 1742...and another in December 1744²,"...the latter was the *La Concepcion* bound from Cartagena for the Havannah and contained much treasure which was therefore probably on the homeward voyage. The prize was carried into Charlestown, S. Carolina³. Frankland continued in command till the peace of 1748. This range of dates, the port of departure, Cartagena, the reference to Carolina and the similarity of the commanders' names, fit well to the suggestion that it was a portrait of Gumilla's piebald—possibly designed for the Queen of Spain—that is here referred to by Parsons, and that it was found by Frankland on *La Concepcion*. The lady who mistook Frankland for Franklin, may have equally well made a slip in the sex of the piebald. What now became

¹ It would be interesting to suppose that the *Encyclopédie* piebald is the subject of the Madrid picture, but it hardly represents a girl of 21, see our p. 239.

² See *Dict. of Nat. Bibl.* Vol. xx. p. 190.

³ R. Beatson, *Naval and Military Memoirs of Great Britain*, London, 1790, Vol. I. p. 266.

of Frankland's picture? Buffon in 1777¹ gave an engraving of a young pied negro girl, who, we can scarcely doubt, was the same as the one described by Gumilla, although the dates of birth are not in absolute agreement, and the white patch on the chin appears to be larger in Buffon's plate than in Gumilla's description. [Buffon's plate is reproduced on our Plate F (18).] Buffon received the portrait in 1772 from Taverne and according to the inscription the subject was named Maria Sabina, born October 12, 1736, of two negro slaves named Martinianos and Padrona² at Matuna, a plantation belonging to the Jesuits of Cartagena in America. The portrait, according to Taverne, formerly burgomaster of Dunkerque, had been found on board an English ship the *Christian* from New England to London, captured in 1746 by the vessel *le Comte de Maurepas* of Dunkerque (or in another part of the account by the corsair *la Royale*). Thus the English in their turn were probably robbed of the Frankland portrait itself or a copy of it as they had robbed the Spaniards. What became of Taverne's portrait is unknown, but in the Museum of the Royal College of Surgeons is an oil painting of the same child with precisely the same descriptive wording beneath as is given in Buffon's work. In this portrait (*a*) the R. forearm and hand are held in front of the chest, exhibiting the dorsal surface, (*b*) the child has a loin-cloth³, and (*c*) the figure is reversed: see our Plates F (18) and SS (151). In every other respect the two are identical. We lay no stress on the reversal, which may have been a slip of the engraver. In the *Oeuvres Complètes* of Buffon, T. v. p. 358, Pl. 16, the reversal has been again reversed, with the result that this plate is more like the original picture. The picture now at the Royal College was bought by Erasmus Wilson, and afterwards presented by him to the College⁴. Wilson could find no history of the picture between the time at which he bought it and the date at which Buffon saw the picture, for Wilson assumes it to be the same as Buffon's⁵. This does not seem certain. Buffon was quite capable of removing the loin-cloth and the marked differences in the number and position of the spots between the plates in his different editions shows the carelessness in such matters a century ago; but it seems doubtful whether he would have altered the position of arm and hand, and we know that a number of copies⁶ were made of the original painting when it reached America (see our p. 231).

It will thus be seen that a number of verbal and pictorial descriptions of piebalds all really turn on this one Cartagena case.

¹ See Bibl. No. 81.

² Gumilla, himself, does not give the names of mother and father.

³ If this be the original arrangement of the picture, the sex may not have been so clear to the lady from Virginia, who reported Admiral Frankland's picture to Parsons.

⁴ Letter of Prof. Keith, Nov. 3, 1909.

⁵ *Lectures on Dermatology*, ftn., p. 8, "That original picture having lately come into my possession, I have the opportunity of exhibiting it here" (Vol. i. p. 111), London, 1878.

⁶ We have heard from Mr J. Maitland Anderson, Librarian of St Andrews University, that on May 11, 1753, "a picture of a girl, black and white, born of two black slaves at Matuna in America," was presented to the University by Sir James Home of Beachader. This picture, which cannot now be found, was undoubtedly a portrait of the same girl.

Gumilla's own detailed description of the child was written when she was five years old. She was then spotted from head to foot with symmetrically disposed white and black patches. The hair of the scalp from vertex to forehead was quite white, the whiteness continuing into the skin of the forehead where the patch widened out as far as the centre of each eyebrow. The white hair formed a "pyramid"; at the centre of the white on the forehead was a black spot. On lower lip was the apex of another white triangle which widening as it passed down had its base at lower part of neck; the rest of the face was dark; breast, shoulders, and corresponding part of back black "were like a priest's collar"; hands to above the wrists, and feet to middle of legs black, were as if gloved and booted; a black spot covered each knee; the rest of the body spotted with white and black. The black of the face, hands and feet was described as "light black" spotted with jet-black patches, "the priest's collar" was said to be perfectly black.

If it be thought that Buffon's plate describes a later state of the child than Gumilla's account, because it apparently indicates more white on chin, we have to notice that it indicates less white in the flare than Gumilla's account. We suspect the differences are solely due to a certain amount of freedom in the Jesuit father, the painter, and particularly the engraver. There is no doubt that Buffon's Maria Sabina, Frankland's Piebald and Gumilla's girl are one and the same case.

On the whole—notwithstanding the discrepancy as to date of birth, which indicates that Gumilla did not see the girl quite at birth—we consider this case as certainly one of congenital piebaldism and not of early leucoderma.

Case (4). *La Mothe's Case*¹. This is the case of a negro boy seen at Bordeaux in 1752 and then aged from six to seven years. His general complexion was between that of a full black and a mulatto; he was spotted with pigmentless, flesh coloured patches; one of these, as large as the palm of the hand, occupied the front and top of the scalp, the hair on this area being quite white and woolly. Belly, thighs and one of the arms marbled; sometimes the black formed the ground, sometimes the white, sometimes the spots were sharply defined, sometimes they merged gradually into the surrounding colour. His legs, from the knee which was mottled, as far as below the calf were white with some spots. But the whole of the lower parts of the feet quite black, like socks. He saw as well by night as by day; the white of the right eye duller (more coloured) than the left. He was born in St Lucia of black father and mother; he had a sister spotted like himself who died very young. There is no note of age when the child was first recorded as piebald, but as the mother is said to have attributed the condition to the impression made on her by unexpectedly meeting a favourite goat similarly marked at a moment when she expected to meet her husband, the child may fairly be assumed to have been pied at birth.

The general distribution of the pigmentation is not unlike that of Gumilla's case; the "flare" in both should be noted.

Case (5). *Parsons' Case*². Dr Parsons published the following case in 1765.

¹ See Bibl. No. 61.

² See Bibl. No. 68.

A black man married a white woman; the first child, born in 1747, a girl, resembled the mother in features and was white all over "except the right buttock and thigh which were as black as the father." Parsons who was a physician saw the child in the spring of 1747, and speaking of the above account says he "found it true as my notes specify that I took upon the spot." He does not mention the child's exact age when he examined it, but goes on to say that the father, who was away at the child's birth, returned home when it was "ten or twelve days" old and "was very much disturbed at the appearance of the child, and swore it was not his; but the nurse.....undressed the infant and showed him the right buttock and thigh, which were as black as the father, and reconciled him immediately." There can be no doubt that the black area was in this case congenital. It is not, however, clear that the case belongs to partial albinism, for we may suppose the skin to have been like the mother's which was not albinotic. Whether it was a piebald or not, is perhaps another question; the asymmetry of the colouring might lead us to suspect the condition was due to naevus or mole¹. Yet the coincidence of four such rare occurrences, a negro father, a white mother, a white and not a mulatto baby and a mole of these dimensions is very improbable².

Case (6). *John Richardson Primrose Bobey*, born 1774. This case was described by Blumenbach in 1790³ and by Granger in 1804⁴. In Granger's *The New Wonderful Museum and Extraordinary Magazine* is an engraving of a young man, "The wonderful Spotted Indian, John Richardson Primrose Bobey," with a detailed account to the following effect. He was born July 5, 1774, at Guangaboo, in the parish of St John, near Kingston, Jamaica, and his parents were black slaves. The mother had had four other children and was so frightened on discovering that this the youngest had a spotted skin that she refused to suckle him. The child was seen and the spotted condition vouched for when "only a few months

¹ Compare Wells' Case referred to on our p. 121 fn.

² A point here deserves some notice. The well observed fact of the mulatto colouring of the offspring of white and negro, depends practically on cases in which the white is the male and the black a female; there is some reason to believe that when the white is the female, and the black the male, a resulting instability of pigmentation may arise. The curious reader will find certain illustrations of this in our Figs. 503—506. In Siebold (*Journal für Geburtshülfe*, Bd. VII. S. 2) is recorded the case of a Berlin negro, who by a white wife had seven mulatto daughters and four white sons. Prosper Lucas (*Traité...de l'hérédité naturelle*, T. I. p. 213), who cites the above cases, also refers to a French girl who was for five years the perfectly faithful mistress of a pure blooded negro, and had three children by him, the first a black negro from the girl's point of view, so that she could not decide to go out with him; the second a mulatto, the third also male was perfectly white, his hair light red, very frizzled, and with negro features recognisable on careful examination. Such cases individually may appear of small weight, but as a whole, they suggest a case for enquiry with regard to the colour of the offspring when the male is black and the female white. A case entitled: "A Piebald Child" is reported in a letter by F. J. Reilly to the *Medical Times*, Vol. I. p. 143, London, 1872. The wife of a milkman came down to find a man of colour stealing milk from a can in the passage. She screamed and he fled, to be met by the husband who was coming home and summarily chastised. The woman later bore a "piebald child," which the mother attributed to fright caused by the negro. The details of the black patches are not very enlightening.

³ See Bibl. No. 118, No. 21, and No. 125.

⁴ See Bibl. No. 139.

old" by Mr Blundell, a Liverpool merchant then in Jamaica, and several other gentlemen. The child was exhibited for money during his second year and at this period a likeness was painted, sent to England and afterwards "deposited in St Andrew's College, Glasgow¹." When 12 years old the boy was sent from Jamaica, where his name appears to have been John Primrose Bobey, to Liverpool; there he was christened and the name Richardson added to his other appellations "in honour" of a Liverpool merchant of that name "who was partial to him." In 1789 (age about 15) he was sent to London and thence to Oxford for inspection by Dr Thompson. About this time he was bought by a showman, named G. Clarke, who had an exhibition at Exeter Change. Some time after he married an English woman "whose brother was painter to the Circus," and the couple set up for themselves in the show business. There are no further remarks.

The above history and the subsequent description were published in 1804; the accompanying engraving, which we have reproduced (Plate G (19)), represents Bobey as a young man and was taken "by our artist at several sittings." It bears no date, but must be taken as representing the man when nearly 30, a year or so before the publication of Granger's *Museum*. Bobey is described as 5 feet 8 inches high, well proportioned and with features relatively handsome for "an original native of America." The parts of the body exposed are the head and face, hands, part of chest and epigastrium, lower part of thighs and upper two-thirds of the legs; clothing covers the rest.

This is undoubtedly the individual described by Blumenbach². Speaking of Ethiopians spotted from infancy he describes "an Ethiopian of this kind," whom he saw in London, a young man, named G. Richardson, a servant of G. Clarke, who had an exhibition at Exeter Change. "The young man was perfectly black except in the umbilical and epigastric region of the abdomen, and in the middle part of either leg, that is the knees, with the adjoining regions of the thigh and the tibia" which were quite white "with scattered black spots"; the hair in the middle of the scalp from the vertex to the forehead was white with a tinge of yellow and curly like the rest of the hair; no mention is made of a central streak on the forehead which is suggested in Granger's cut. Both the man's parents were "perfectly black." Blumenbach gives a picture of the man (see our Plate G (20)). It is not, however, a portrait; he had a picture of a negro drawn and the white areas marked in upon it. If we can trust the dates suggested above, Blumenbach must have seen Bobey when he was about 16, and Granger's picture

¹ Careful search for this portrait has been most kindly made in Glasgow by Professor Cormack of Anderson's College Medical School, but without success (April, 1907).

² Blumenbach gives no illustration in the 3rd (1795) ed. of the *De Generis humani Varietate Nativa* from which we extract his account. But he does in his *Beiträge zur Naturgeschichte*, 1790, under the heading of *Gefleckter Neger*. There is little doubt that he must have seen Bobey in 1789. It is in association with this spotted boy that Blumenbach starts the theory that lighter or darker skin pigmentation is due to the lesser or greater quantity of carbon in the *rete malpighii*; white patches, he says, result from "eine Unthätigkeit oder Stockung in den Hautorganen die zu diesem färbenden Präcipitationsprocess nöthig sind"—a result not very helpful to-day.

must have been taken ten years later. Remembering the conditions under which they were taken, we must admit that there was no increase in the white areas in the course of the ten years' interval. It is most unfortunate that the Glasgow painting of about 1776 cannot be found, that we might have a longer certainty as to the stationary character of the patches. We know that leucoderma can be arrested, but on the whole the case appears to be congenital. And for this reason: the only ground for questioning the statement that the mother feared to suckle her piebald offspring, would be that for exhibition purposes a born piebald was of more value than a "negro who had turned white." As a matter of fact the interest in the latter type seems to have been far greater. In the state of feeling at the time with regard to negro slavery, there was much excitement about those cases in which "the negro turned into a white man," and the only ground upon which we might feel called upon to doubt Granger's report—the possible profit in a deception of this kind, which emphasised the congenital character—seems wholly wanting. It must be remembered that for at least half a century after this, it was usual, even in scientific accounts, to group without distinction partially albinotic and leucodermatous negroes together.

Case (7). *Le Masurier's Case*, 1782. This case has hitherto depended entirely, as far as we can discover, on a double picture, certainly painted with remarkable skill and now in the Gallery of Anthropology in the Paris Museum. It is entitled: *Ad vivum accuratissime pingebat in Martinica Le Masurier anno 1782*. "In the one canvas¹ a negro child aged some months is seen from the right side and showing about three quarters of the back; in the other we have a front portrait. The face and the skin, where white, are of rosy tint; the head is black but a very symmetrical white spot is seen on the chin and descends to the throat, another just as regular shows itself upon the forehead and rises on to the scalp. The front of the body is white scattered with black spots. The arms, forearms, the thighs and the upper part of the legs are also white. The neck, the back, and the buttocks are black. One would say that a black veil had been extended over the back, and a white veil spotted with black over the front; one would add that the child appeared to have on black shoes and black mittens, the ends of the fingers of the hand being white." Cf. our Plate VV.

It will be seen that the inscription on the picture does not state that the child was born in Martinique, but only that Le Masurier painted it there.

Case (8). *Arthaud's Case*. Now a case of a piebald negro girl has got into many textbooks as Arthaud's Case². As a matter of fact she was seen by Arthaud at Cap in May, 1784, and was then 20 months old, he describes her as a Creole of St Lucia and belonging to Sieur Vallois, surgeon dentist. A much fuller account was given by Dr John Morgan³ who brought her before the Philosophical Society of Philadelphia also in May, 1784, and describes her as 25 months old, gives her the name of Adelaide,

¹ See Bibl. No. 415. The size of the pictures is 85 cms. × 65 cms. Plate VV (156) is from a special photograph taken in Paris for us; (157) is from *La Nature* by permission.

² See Bibl. No. 108.

³ See Bibl. No. 100. For the age discrepancy see our ftn., p. 239.

and says she belonged to Mons. Le Vallois, "dentist to the King of France at Guadaloupe¹." We shall follow Morgan's account. "Adelaide is of a clear black colour verging to brown except that she has a white spot bearing some resemblance to an aigrette, the point of which is at the root of the nose, and it rises into the hair above the forehead, of which it occupies about an inch in width from the margin of the fontenelle. In this part the colour of the hair is white and curly like a negro's and thicker in that part. In the middle of the forehead and on the aigrette is a large black spot²; on the external side, next to the temples, about one half of each eyelid, both upper and lower, is black, and the remaining half next the nose is white; the eyes are black and lively; a little to the left and towards the middle of the chin a white spot begins which is long in proportion to the breadth, but smaller than that of the forehead; it stretches under the chin to the upper part of the throat. Parts of the trunk are the same colour as her face, but the loins and thicker parts of the buttocks are of a deeper black. The arms from the upper and middle parts are white and interspersed with black spots; there are some similar and more numerous spots about her knees. Upon the large black spots there are also many smaller and blacker spots, many of these spots divided into rays like a star which can be seen when looked at closely. The hands and middle part of the forearms and inferior and middle parts of the legs and feet are black, and have a pretty striking resemblance to gloves. The white that prevails over the breasts and over the belly, arms and thighs, has a lively appearance, the skin is soft, smooth and sleek. Adelaide has fine features and few negroes have such a beautiful form; she is cheerful, gay and sportful, is as tall as children of her age, but evidently has a delicate temperament, yet enjoys good health. Neither hath she eyes, ears, nor any particularity in her features or external conformation like what is seen in white negroes, whose skin is altogether of a dead white colour, and whose woolly white hair and features resemble those of their negro parents."

There can be, we think, after this description little doubt that Adelaide was the subject of Le Masurier's painting.

"A certificate which Mons. Le Vallois has with him, legally authenticated by Mons. Blin and physicians and surgeons at Grandterre [Guadaloupe], attests that Adelaide was born at Gros-Islet in St Lucia, that Bridget, her mother³, is a negro of the Ibo nation, and her father, named Raphael, is a negro of the Mina nation."

As in the case of Maria Sabina, whom Adelaide closely resembled, we are thus able to roll three or four records of piebalds, which have been often treated

¹ We do not know what became of Adelaide, but it seems probable that Vallois carried her to France, and that she was the young pied negress whom the unfortunate Queen had attached to her Court at the outbreak of the Revolution: see Bibl. No. 147, p. 73.

² Cf. our Case (3) of Maria Sabina and particularly Plate SS (151) with Plate VV.

³ Adelaide's mother while pregnant with her "used to delight in lying out at night contemplating the stars!"

as distinct, into one individual case¹. We do not think that any stress should be laid on the fact, that Le Masurier painted when several months old the child in Martinique, while she had been born in St Lucia, for this is only some 20 miles from Martinique, and we very soon find that she is in possession of an inhabitant of Guadaloupe, is seen at Cap (St Dominique) by Arthaud, and before she is much more than two years old appears at Philadelphia.

Quite recently Prof. R. Blanchard has published an account of Masurier's picture of Adelaide of St Lucia, assuming that no accounts had dealt with this subject². He has overlooked those of Morgan and Arthaud. But he has made an important additional discovery. In the Warren Anatomical Museum of the Harvard Medical School, Boston, is a statuette in wax 26 cms. high; it is the oldest object in the collection of the Boston School of Medicine and is dated August 15, 1783. There are two documents relating to it; one states³ that the child represents Magdeleine, born in St Lucia in January, 1783 (? 1782), of negro parents (mother a native of St Lucia, father an African slave), and of the same colouration as when she was modelled in wax. She was otherwise of sound health; she was exhibited in Martinique and had been bought for "an immense sum" there by an unnamed person who proposed to show her in Europe. Meanwhile a statuette in wax had been made of her (? in Martinique) by an unknown artist, which became the property of Mr Silas C. Brenton, a rich merchant of Boston, who taking it home, passed it on to Ebenezer Storer, Professor in the School of Medicine. There can be no doubt that Adelaide and Magdeleine are one and the same child, and that the unnamed person is the surgeon dentist Vallois. Blanchard suggests that Le Masurier made the wax statuette as well as the pictures of this piebald. This is quite possible, though it has not been at present demonstrated. The identity, however, of the Arthaud, Morgan, Le Masurier and Harvard piebalds is a point of considerable interest. Cf. our Plates TT and VV.

Case (9). *Le Vallois' Pied Mulatto Boy, Jean Pierre*. Born 1782—3. This case is also described by both Arthaud and Morgan⁴. It possesses some points of extraordinary interest, because this boy was born at Grandterre, Guadaloupe, of a negro wench Carolina and a white European man. The boy should have been mulatto, but he was actually a pied mulatto, and in a certificate from the medical men at Grandterre, seen by Morgan, it was declared that the European "father of Jean Pierre has white spots (that is of a deeper white than his natural skin) of the

¹ The Case of Adelaide has also been cited as an independent piebald case due to Rayer, because he was one of the first to describe Le Masurier's picture in the Paris Museum: see Bibl. No. 210.

² "Sur un cas inédit de négresse pie au XVIII^e siècle," *Zoologische Annalen*, T. I. pp. 41—6, 1904; Encore sur les nègres pies. "Un cas inédit du début du XIX^e siècle," *Bulletin de la Soc. française d'histoire de la médecine*, T. V. pp. 210—19, 1906; Nouvelles observations sur les nègres pies. "Geoffroy Saint-Hilaire à Lisbonne," *Ibid.* T. VI. pp. 111—135, 1907; and lately "A propos des nègres pies," *La Nature*, 38 Année, pp. 3—8, 1909.

³ We owe a type-written copy of one document and two excellent photographs of the statuette to the authorities of the Museum: see our Plate TT.

⁴ See Bibl. Nos. 100 and 108.

same shape and in the same parts of his body as his son and that the mother¹ and one of the brothers of this boy's European father have like white spots in the same parts of the body." See our Fig. 651. We have thus not only the inheritance of piebaldism for three generations, but the remarkable fact that piebaldism is a feature which can be transmitted even with a colour change.

Morgan's account of Jean Pierre's colourations runs: "The boy's body is entirely of the colour of a mulatto, except that he has from nature a white aigrette in his forehead like that of Adelaide. The hair in that part is white mixed with black which is not so in Adelaide. The stomach and the legs from two inches above the ankles to the middle of the calf are entirely of a beautiful lily white; there is also a white spot on the upper part of the penis. Over the white parts of the legs is a light white down, longer and thicker than children usually have."

Jean Pierre was two years old when seen by Morgan and 19 months old when seen by Arthaud². The latter gives rather fuller particulars of the boy. The tuft of white hair mixed with black was on the top of the head a little to right of middle line; another larger tuft was at the middle of the front of hairy scalp, and this continued into white band on forehead which passed obliquely down to the left to the eyebrow, which was half white; a white star from below breast to umbilicus and other whitish-yellow spots over hypochondrium and below right nipple; a white band with scattered light yellow spots on inner part of arm and upper part of forearm and another from olecranon to middle of inner part of forearm; legs, from two inches above ankles to middle of calf, white. Arthaud also notes the white spot on the penis³.

Case (10). *Da Rocha's Pied Girl*. In the Faculty of Medicine at Paris, and now in the *Laboratoire de Parasitologie* of that Faculty, there is a picture of a pied girl. Removed from its original position owing to structural changes, it was stored away, and has only recently been brought to light and restored under the care of Professor R. Blanchard⁴. It is identical with a picture in the Ethnographical Museum in Madrid. Both Paris and Madrid pictures have a Portuguese inscription stating that they were painted after nature in 1786 by Joa^m M^{el} da Rocha. Blanchard has discovered that a less finished portrait of the same girl—identical with the other two for the dimensions of the figure and the position of the spots—exists in the Bocage Museum of the Polytechnic School at Lisbon, and was formerly in the Musée d'Adjuda there. Da Rocha was a Portuguese painter of some distinction, and there is no doubt that the three pictures were Portuguese in origin. At Madrid there is an entry in the archives of the Museum, Sept. 22, 1792: Don Jose

¹ The mother of this piebald during the time of her pregnancy with II. 2, is said to have been "frightened on having some milk spilled upon her."

² Arthaud says he saw the children in May, 1784 "au Cap," and Morgan's title says they were also exhibited to the Society in May 1784, at Philadelphia; they might have travelled so far during May, but they could hardly have gained five months of age. Probably Arthaud made a slip as to the month.

³ He takes this occasion (*loc. cit.* p. 278) to say that "J'ai vu depuis un nègre dont la verge était blanche naturellement"—a case often cited in later literature.

⁴ *La Nature*, 28^e Année, p. 6. The size of the picture is 157 cms. × 97 cms. We owe the loan of our block to the kindness of Professor R. Blanchard.

Pavon presented a collection of insects from Peru, and the portrait of a pied girl, born of negro parents, sent by the Governor of St Dominica. According to Blanchard, Da Rocha never left Portugal, and St Dominica belonged at that time to Spain; he suggests that the girl must have been painted in Portugal. But how did the girl come to Lisbon and why was the picture sent from St Dominica? Blanchard holds that she was sent to Europe by the Governor, who commissioned Da Rocha to paint her. If so, did the picture go back to St Dominica, in order to be presented six years later to Madrid with a collection of insects from Peru? Blanchard accounts for the fact that no description of this piebald was published, although three paintings were made of her, by the suggestion that she died soon after arrival by smallpox or some other infectious malady. It is best to say, that at present we are wholly ignorant on these points. The piebald in the Paris picture is about 14 years of age, the figure is in some respects more like that of a boy than a girl. The shoulders and face, except for the flare with the white lock, are black, the lower arms from elbow to hand are black, the legs have black "socks"; the rest of the body is white with occasional black spots, the most conspicuous of which is a large elliptic spot on the left breast. The figure is distinctly a noteworthy contribution to the list of early piebalds: see our Plate SS (152). The Madrid picture is in a better state of preservation than the Paris picture, and, from the photograph most kindly sent us by Professor I. Bolivar of Madrid, is without doubt a really artistic work. This picture again emphasises the view that the subject was a boy.

Case (11). *The Negro Girl of St Thomas's Hospital, London.* In the Museum of St Thomas's Hospital is a plaster cast of a pied negro female baby of which no particulars of any kind are, or seem likely to be, forthcoming; it has been there for many years and is not mentioned in any of the catalogues. Three aspects of it are given on our Plate E. The cast is about 12 inches long, but obviously is a reduced model. In the presence of the flare at the centre of scalp and forehead and of the glove-and-stockings-like arrangement of dark skin on the hands and feet, this case resembles several of the classical cases above discussed, but the arrangement of patches on the body does not agree with any published case we have come across. The whitening of half the eyebrow without whiteness of adjacent skin, and of *alternate* toes and fingers suggest that the portraiture may be partly made up; but the cast as a whole is so lifelike that one cannot doubt that it is essentially genuine and represents some case of a piebald negro infant, which has escaped our search of the records, or possibly all record whatever.

Case (12). *Richardson's Spotted Boy. George Alexander Gratton.* Born 1808. Thus far, with the exception of Parsons' Case (see our p. 233), which is peculiar, and possibly not a true piebald, all our cases have borne a certain family resemblance. This type is, however, widely deviated from in the present case; the flare has extended all over the top of scalp to the breadth of the forehead; it has passed down over the nose and upper lip and joins on continuously with the chin-patch, the cheeks being left black with goggle-like pigment rings round the eyes; the "gloves" have practically disappeared, and the "stockings" are almost gone; the shoulder and

thigh patches remain, but the total pigmentation on the body is much less than in any of the above type cases. Gratton¹ was born about June in 1808 in the island of St Vincent; his parents were negro slaves of a Mr Alexander and natives of Africa. He is said to have been exhibited as a curiosity in St Vincent, but when 15 months old was shipped to Bristol and consigned for three years to a showman named Richardson. A portrait is said to have been painted when he landed at the age of 17 months and from it an engraving was made, a copy of which is now (1907) in the possession of Mr H. W. Badger, the parish clerk of Marlow, Bucks. Our figure Plate F (17) is a reproduction of this². In 1811 his portrait, partially clothed, was painted again and this picture (seen by us) now hangs in the vestry of the church at Marlow; our figure Plate F (15) is from a photograph of this painting³. It shows, as far as the clothing allows comparison, that the distribution and relative size of the black areas had not altered. Our photograph does not give the feet well, but on the painting itself the outer side of left foot and the right ankle are distinctly visible and are pigmented. A third and garbled representation of the boy is given in Chambers' *Book of Days*, Vol. II. p. 267, published in 1864, and is reproduced on our Plate F (16). It cannot be called a portrait at all, for the features are those of an adult European, and the white part of the scalp appears to be bald like that of an old man. Thus but little value can be attached to the absence of the pigmented rings round the eyes and the patches on the cheeks. It will, however, be seen that the general arrangement of black and white on the limbs and trunk is approximately that of the other two portraits. Chambers does not mention either the date or source of his portrait. The boy died at the age of four years and nine months and was buried, by his master Richardson, at Marlow; the inscription on the tombstone gives the date of death as Feb. 3, 1813; the register in the church gives April 12 for the burial and states that the body was brought from Stoke Newington where the death had taken place. Richardson, himself a native of Marlow, was buried there in 1836, and the engraving and painting passed from him to an ancestor of Mr H. W. Badger.

With this "Spotted Boy" our list of the classical cases of negro piebalds is completed. But there is a further case—apparently very little known—which closely resembles these⁴. It is given as Case (13) below.

Case (13). *Charles Darwin's Case*. The photograph of this boy was presented by Darwin to the Museum of the Royal College of Surgeons (Section, *Dermatology*, No. 140). We reproduce this photograph, Plate SS (153). It is a noteworthy modern addition to the classical cases already described of negro piebaldism. The photograph

¹ See Bibl. No. 298.

² The legend runs: "Published Nov. 11, 1809, by Richard Gretton Esq. London, and sold by D. Orme, 308, Oxford Street." "The Portrait of George Alexander, The Extraordinary Spotted Boy from the Caribbee Islands in the West Indies."

³ A coloured copy of this painting will be found at the Royal College of Surgeons (*Dermatology*, No. 138). Examined by E. Nettleship, 19/1/10.

⁴ The "piebald from Loango" given in Ratzel's *History of Mankind*, Vol. II., p. 319, looks as if it were merely a case of leucoderma. No details are given.

was sent to Darwin in September, 1877, by Mr E. A. Leng of Alabama. The following account is extracted from Erasmus Wilson's *Lectures on Dermatology*, London, 1878, p. 7: "Black and white negro boy, aged six, born of healthy negro parents in the southern part of America. He was brought to Liverpool for exhibition, but died two weeks after his arrival, of inflammation of the bowels, preceded by intermittent fever. He had been healthy and sprightly up to the time of this attack. His eyes were blue, and the colour of his skin decided black and white, without blending or intermediate tint. His fate reminds us of that of Richardson's spotted boy; and is suggestive of a lurking debility of constitution in these achromatous examples of the human race." The bulk of the skin and hair are in this case white. From the photograph, which shows the back reflected in a mirror, we draw the following description. Trunk and limbs white except for scattered rounded islands of normal dark colour, which show some tendency to grouping on lower abdomen and about knees. Hands and feet up to just above ankles mostly pigmented with some white patches. Chin white. A *very* broad "flare" from forehead to about posterior end of parietal; on right forehead it takes the eyebrow but not on left. Neck all round, interscapular region of back and entire lumbar region and buttocks black¹.

Out of the ten independent and detailed cases of piebaldism we have reported above—whose births with one exception lie between 1738 and 1808—that of Parsons may be placed on one side. Of the remaining eight, six are strikingly alike in general pigment distribution and even Richardson's "Spotted Boy" and Darwin's Case may be looked upon as rather extreme variants of this same type. They have all the "flare," the hands and feet are generally pigmented, and a large frontal area on the belly is as a rule free of pigment.

The presence of the flare in these congenital negro cases is remarkable, and we shall note it later on in many other certainly congenital cases; just as frequently we note its absence in many typical leucoderma cases. The reader may look at our Plates A, C and D. But is it always absent in leucoderma? We have noted the following cases which possess the flare and have been classed as leucoderma by the recorders:

(a) The three siblings with flares (see our p. 203) given by Gould and Pyle. No definite evidence of leucoderma is given by the authors and no further information, they say, can now be provided. We have several cases of hereditary flares—but this may be one of the exceptional cases in which leucoderma started in childhood and was hereditary. In the two families, containing twelve cases of hereditary leucoderma recorded by one of us, there was no flare running through the affected members. We believe the Gould and Pyle children to be really cases of partial albinism.

(b) Sir Richard Burton's Negro reproduced in our Plate B. He has the dark gloves, stockings and epaulettes, the chin patch and the flare. Burton saw him in front of a hut at Accra, and says he had once been black. He does not give any

¹ A description attached to the photograph speaks of white with some *brown* patches; presumably this means normal negro pigmentation, as the early account says "decided black."

details of any conversation with him (see our p. 22) and one cannot be sure on what information Burton based his statement as to change of condition, or that he knew of the existence of congenital partial albinism.

(c) Dr Piffard's Case of a little "coon" exhibited as the "Leopard Boy" in connection with Barnum's circus has such a flare. It is given as an illustration of leucoderma in Piffard's *Diseases of the Skin*, 1891, p. 97, and represents a negro (mulatto?) boy. Dr Piffard himself says he has never seen a congenital white patch case. The case is somewhat noteworthy because the hair of the "comb" appears rather longer than the rest of the scalp hair.

(d) A central frontal area on a large scale is seen in the photograph of a middle-aged Englishman with leucoderma in Sir J. Hutchinson's collection at the Polyclinic in Chenies Street.

The two last cases are those of well-known skin authorities and are directly used to illustrate the character of leucoderma, so presumably there is small doubt that the progression of the leucosis had in these cases been marked as its observation would be crucial in classifying them.

(e) Maas¹ in 1892 exhibited a "Tigermenschen" at the Berlin Anthropological Society. He had the white comb and spots of white. He was born at Cape Town and aged 19; his parents were normal. The condition was said to have come on at five years of age. In this case again the evidence for leucoderma is not as strong as we might desire.

To sum up, we cannot at present use the flare as any certain criterion; it does occur with great frequency among recognised congenital negro piebalds; there are a considerable number of white race piebalds in which it is certainly absent; there are many cases of leucoderma in which it is equally certainly absent; there are some cases in which it is apparently present, but we consider its presence would justify the inquiry for more definite evidence than is sometimes given for the acquired character of the leucosis. There is finally a great range of congenital spotlings in whom the flare is the chief leucotic feature. We shall deal with them very shortly.

We now pass to the classical cases of congenital piebaldism in the white races. So late as 1808 Gaultier² stated that no case of congenital albinism had been observed in the white races; and Rayer³ in 1826 could repeat the same statement. This attitude is no longer possible, and just as the case noted by Seligmann⁴ in a dark race makes us more ready to accept the early negro piebalds, so that of Gilbert Smith⁵ shows that the diagnosis of congenital partial albinism was probably correct in the cases of leucosis recorded as such in the course of last century. We must stay, however, to note a possibility of differentiation between the negro and white race cases. The negro piebald can be such because the light patches are (i) truly albinotic or pigmentless areas, or (ii) because the patches are only relatively less pigmented, *i.e.* appear to approach the skin of a European white. The latter alternative may perhaps have been the case of Adelaide the piebald negress mentioned above: p. 237. It is possible that a European piebald might arise from two grades of skin colour,

¹ See our p. 222. ² See Bibl. No. 147, p. 73. ³ See Bibl. No. 179. ⁴ See p. 248. ⁵ See p. 246.

e.g. the alternation of a dark and fair complexion; but so far as we are aware the recorded cases point to pigmentless or truly albinotic areas, while possibly the negro cases all do not. The point, however, might be carefully borne in mind, when occasion arises for the examination of further white or dark race piebalds.

Piebalds in the White Races.

Case (1). *Rennes' Case*, 1831. Rennes published a case¹ at an early date, which has been overlooked by those who denied piebaldism in the white races. It concerned a male adult of small stature, feeble constitution and sallow complexion, who had patches of white, irregular in size and distribution, on various parts of his skin; they were said to have been present from birth; some were eight or ten inches in diameter; the hair on the affected areas was white; thus the hair on the back of the head was white, part of the axilla, and the lower part of the pubes were white, the penis and upper part of pubes were dark. The eyes were not affected, but the colour of the irides is not mentioned.

Case (2). *Cornaz's Case*, 1849. Cornaz² described a piebald man born in the Département of the Ariège in 1814, and aged 35 when seen in 1849. The white spots had been present from birth and during his infancy were called "milk-marks, though his mother did not attribute them to any special cause³." He was one of twins, the other, a female, being normal. No albinism was known in family. When seen (1849) complexion dark; some white hairs on left side of head; some small tufts of white in the otherwise black beard, moustache entirely black; a white spot on left ear and near right ear, one near the nose and several on chin and neck, one on right shoulder, and on chest, and a large one on left arm; penis and scrotum partly white and partly pigmented; some white spots in dorsal region and on lower limbs. On some of the white spots the hairs were white, on others black. Irides brown with a greenish tinge in lower part.

Bärensprung⁴ was the first to observe and publish under the name of *Albinismus partialis* a number of cases which he had convinced himself were congenital⁵. He certainly was the first to recognise the importance of distinguishing between congenital and acquired leucosis. He first drew attention to the fact that the leucosis cannot be recognised at birth, but only when later the rest of the skin has acquired its permanent darker colouring.

Case (3). *Bärensprung's Case* (i), 1848. Seen in this year in the village of Radlin in Oberschlesien: a young man, whose skin was spotted over and over with white. The spots had very diverse form and size, and as the rest of the skin was much sunburnt, so these unpigmented patches were very conspicuous. Bärensprung counted forty such spots, distributed without definite rule, the largest of these

¹ *Archiv Gén. de Médecine*, T. xxvi. p. 371, 1831.

² See Bibl. No. 256, p. 320.

³ It is not stated that the mother was seen, so this information may have come from patient.

⁴ See Bibl. No. 257.

⁵ "Ich habe den partiellen Albinismus bei weissen 6. mal gesehen und glaube, dass er in allen diesen Fällen angeboren gewesen sei, obgleich er erst später bemerkt wurde."

occupied the lumbar region and extended down over both hams; another was upon the pubic region and the growing hairs of the neighbourhood shared the whiteness of the skin. Small wholly irregular spots occurred on the stomach, breast, neck and the extremities. On the face were only a few light spots, but on the forehead sharply defined patches began again and spread to the head, where the hair on the large spots was snow-white as in the case of "Kakerlaken." Three or four white tufts of hair occurred among the rest, which had a chestnut brown colour. These white spots were not differentiated from the rest, but Bärensprung thought the surface somewhat more delicate ("etwas zarter"). The eyes were brown and without any photophobia. His mother told Bärensprung that she had noticed the spots in the first year of the boy's life, but that somewhat later they had become more distinguishable ("deutlicher geworden"). Her two other children had nothing of the sort.

Case (4). *Bärensprung's Case* (iv). This case was that of a girl who was received at the Charité in Berlin on account of a vaginal blennorrhoea. She had almost symmetrical distribution of the white patches. The largest occupied the genital regions and stretched from the os coccyx to the mons Veneris, divided by anus and vulva into two equal parts. As this region is usually very deeply pigmented, the contrast of the sharply defined milk-white appearance to the brown surroundings was very remarkable. The labia minora and majora were without any pigment, flesh red, and the hair upon them white, while the hair of the mons Veneris was brown, as the skin here was no longer without pigment. On the inner side of the thigh were several small white spots. The navel was surrounded by a white spot as big as a thaler, both areolae were perfectly white; two almost perfectly symmetrical spots were situated on left and right hypochondrium and two similar ones on the buttock. All these spots were completely white, sharply defined, but not distinguished in any other way from the adjacent skin. They were noticed in early childhood, had neither increased in size nor number, but had become more conspicuous as the surrounding skin had grown browner.

Case (5). *Bärensprung's Case* (v). A girl had a hand-broad belt of white across epigastrium and hypochondrium. She had other small and irregular spots on the breast, back and thighs. Another case of this sort is also noted by Bärensprung.

Case (6). *Lesser's Case*. This case is given by Lesser in Ziemssen's *Handbook of Diseases of the Skin*, 1885, p. 447. Its original date is therefore anterior to this English translation; Lesser in his own treatise¹ discusses the case. The patient was a European girl, aged 19, with an asymmetrical lack of pigment. The patch extended over right hypogastrium and part of corresponding pubic region, where hair was white. The medial boundary being almost straight and nearly at middle line. *It had been present at birth*². There was also a patch on right side of neck. Lesser had the

¹ *Lehrbuch d. Haut- u. Geschlechtskrankheiten*. Zehnte Aufl. Th. I. S. 226, Fig. 15, 1900.

² "At birth" must be given rather a loose significance in cases of this kind. While pigment is found as early as the fourth and fifth week in the eyes, *e.g.* in retina, and again in the hair in the fifth month of the human foetus, the dermo-epithelial pigment is only formed after birth: see Unna and Besiner, *Bibl.* Nos. 457 and 489.

opportunity of examining the white skin of such an area from the abdomen of a girl who died of phthisis (probably the above case) and found the skin in every respect normal except for the absence of pigment¹.

The above six cases² will be sufficient to indicate that piebaldism actually occurs in the white races. We shall consider certain minor white patches later under the section on *Spotlings*. We purpose to add here some account of partial albinism in a European boy, which coming under our own eyes convinced us of the certain occurrence of this condition, and we shall then pass to modern cases of partial albinism in dark races.

Case (7). *Dr Gilbert Smith's Case of unilateral white area, with evidence of concentration of pigment on a neighbouring part of the skin. Naevus in a brother.* In May, 1908, Dr Gilbert Smith of Hindhead was kind enough to let one of us examine and obtain photographs of the case illustrated in Plate J (27) and (28). The subject, a well-grown and very intelligent lad with dark, straight hair, dark irides, and decidedly brunette skin, was 17 years old when the photographs were taken. On the right side of the body the skin over a large area from the umbilicus in front almost to the middle line behind is quite white and contrasts strongly with the colour of the rest of the body. This white half-belt has an average diameter about five times that of the umbilical circle, the projections or "headlands" of one border being generally compensated by "inlets" on the opposite side, but where the white descends for a short distance into the groin the width is greater. The white area is unbroken over the front and side but behind in the lumbar region it is interrupted by tracts of normal skin, the white parts forming islands of various sizes the shape and direction of which often follow the horizontal folds of the skin. The boundary between white and pigmented skin is well, even sharply, defined and presents numerous larger and smaller curves nearly all of which are convex towards the pigmented skin. No difference can be detected either by touch or sight between the white and the normal skin except the difference of colour; in level, texture and apparent structure they are alike. At one point about the centre of the white region is a small, round, intensely pigmented spot like a small pigment mole. No moles on any other part of the body. The pigmentation is not perceptibly more intense along the borders of the white area than on the general surface; but it is important to note that the skin on the same side (the right) below and a little external to the nipple is considerably more pigmented than the general surface, although there is no such increased pigmentation of the corresponding region on the left side. This excess

¹ This case has been often cited as *proof* of no structural differentiation in the albinotic skin. As comment we may state (i) that to any one familiar with the extreme difficulties of the microscopic analysis of tissue-cells, it is not easy to prove an *absence* of differentiation in structure, (ii) that the case was *phthisical*, and although the congenital nature of the leucosis is asserted, it would be of value to have a modern confirmation in a non-phthisical case; see our *ftn.*, p. 207, for references as to pigment anomalies in cases of phthisis.

² The case given by Hebra—"Ein Fall von symmetrischem partiellem congenitalem Defect der Cutis" (Bibl. No. 379, Bd. II. S. 85—93)—of a female child born with two reddish yellow hairless patches on the sides of the head, is not, we think, demonstrably a case of partial albinism. The child died in three days, before pigment conditions were definitely developed.

of diffuse pigmentation in the right infra-mammary region although quite striking in the living subject and fairly well shown in the original photograph is only visible in the half-tone reproduction as a faint mottling that might readily be taken for an effect of shadow¹. Evidently we are, in this case, not dealing with mere regional absence of pigment but, at least to some extent, with irregularity of distribution on the affected half of the body. This lad is the first-born of three and was born, after instrumental labour, at full term, when his mother was 39; she believes the white mark to have been present at birth, but the point cannot be absolutely settled for she herself was ill for some time after the confinement and neither her then medical attendant nor the nurse can give positive information. The lad himself cannot remember the patch ever being different from what it is now and says it is not increasing, and Dr Gilbert Smith, who first saw the place several years ago, does not think it has changed. Tested for sensibility the white area in front of trunk and corresponding normally pigmented skin were found to have no perceptible difference. The second born child, also male, aged 14, with dark hair, eyes and skin, has a large round, perfectly flat, capillary naevus ("a tomato") over the middle part of the sacrum; it is nearly central, encroaching almost exactly equally to right and left of median line; it forms an irregular oval about 2" horizontal by 1.5" vertical diameter. The lower boundary is a continuous convex curve, the upper boundary slightly concave with three "peninsulae" and one separate small "island." No other congenital marks. The third and last born, also male, aged 11, with dark hair, has no marks anywhere. The mother is a native of Suffolk, the thirteenth in a sibship of fourteen; she married at 37 and had her first child at 39; her hair and skin are dark. The father, a swarthy, black-haired, brown-eyed man, was born at St Austell, Cornwall, and is a mechanic; he is one of ten siblings. There is no consanguinity of parents or grandparents and no albinism has ever been heard of on either side; the siblings of the father and mother have not many offspring. Since attention was drawn to the marks on his two sons—say, for a year past—the father has noticed that the skin of his own penis is partially white. On examination (Jan. 1910) it was found that the dorsum and sides are white—or very much whiter than the neighbouring skin—from the root of the penis to the prepuce at about the line corresponding to the corona glandis. No hairs grow on the white part; the pubic hairs are black. The border of the white on the dorsum of prepuce is convex towards the pigmented area and well-defined; at the sides and root no definite edge can be made out to the white area. The father stated that he had no white patches on his limbs and on examination of the trunk, back and front, no white patches were found. The son is an undoubted white piebald, and it is of much interest to find this piebaldism associated with pigment vascular anomalies in both father and brother. Darwin's Case² and Gilbert Smith's Case suffice to demonstrate that piebaldism is not merely a product of the inferior diagnosis of a less scientific age. But we have other important modern cases to record.

¹ The thin vertical dark line on the white area in Plate J (27) is from a flaw in the negative.

² See p. 241.

Seligmann's Piebald Papuan Boy. This is a striking case of piebaldism, which owing to the kindness of Dr Seligmann and Administrator Murray we can illustrate by photographs taken at an interval of nine years (see Plate I (23)—(26)). In these photographs we see that spots have actually grown larger, but just larger as the boy himself has grown larger¹. There can be no doubt of the congenital character of this case. Seligmann saw this boy when in New Guinea (1898) with the Cambridge Anthropological Expedition. Our Plate I (23) is from a photograph taken by Mr A. C. English, Government Agent of the Rigo district, in the summer of 1898, when the child was three to four years old². Mr English knew the parents and had known the child from its birth and assured Dr Seligmann that it had always been piebald; he had never seen a child like it, nor could Dr Seligmann hear of any other cases. In the presence of the central white band or "flare" on the forehead and the retention of pigment on the feet and lower part of the legs ("stockings") the case resembles several of the earlier ones; but the upper extremities are entirely dark and there are but few *small* patches of either colour. There was no history of albinism or of any unusual skin condition to be found in the child's relatives. The three later photographs (1907) we owe to the kindness of Administrator Murray. They show in a pronounced manner the growth of the leucotic patches, and even of the pigment "islands," with age in a nine years' interval. The case, like Dr Gilbert Smith's, indicates that genuine piebalds can still be discovered, if careful search be made for them. These instances in a white European and a dark Papuan are of peculiar interest for they provide illustration of *large* leucotic areas on the trunk, which are a convenient, if not wholly scientific criterion of genuine piebaldism. We turn now to certain modern cases of congenital leucosis in negroes which are more or less on the borderland between the genuine piebald and the spotling.

Neveu Lemaire's Case. This was described in 1901 and a full account will be found in our Pedigree Appendix, Fig. 513. This case is of singular interest. The father was a pied negro and he had three pied sons. The father and eldest son are not fully described, the third son might pass for a spotling, but the second son, to judge by the description, was certainly a genuine piebald, for besides the "flare," which he shared with his relatives, and the smaller white spots, he had a large square white area extending almost from nipples to navel. No photographs appear to have been taken.

The Three Striped Graces ("Les trois grâces tigrées"), Mary, Rose and Fanny Anderson. Rather meagre accounts of these piebalds have been given by Maas (1896)

¹ Hutchinson ("Some Additional Cases of Leucoderma," *Clinical Lectures and Reports, London Hospital*, Vol. 1. pp. 14—18, 1864), gives as Case V. a lad of 19, with fair symmetry of leucotic patches, black hair, dark eyes. The mother thought he had some patches "at birth." They extended in childhood, and the boy himself thought they had not done so lately. This may very well be a case of leucoderma (see our p. 226, fn.²), but the descriptions of mother and son are just what we should expect in a case of congenital piebaldism; the increase in size of the white patches, and the check to this increase with adult age.

² We owe the loan of the negative for reproduction to Dr Seligmann. He has kindly supplemented some of his published notes of this case (Bibl. No. 496, p. 803) by further written information.

and Baudouin (1905): see our Pedigree Appendix, Fig. 509. They gave gymnastic performances in the music halls of Berlin and Paris. The details of leucotic distribution are not given, they have the "flare" extending into a comb, and they are said to have many white spots and streaks on their skin. A photograph of three piebald negresses has recently been published in the *British Medical Journal* (June, 1910, p. 1480) by Sir Jonathan Hutchinson and we are able by his kindness to reproduce it here (see our Plate VV (158)). He obtained the photograph from Professor Neisser. It shows three negresses with "flare" and "comb"; two have white areas on the chin, the third on the nose. No other parts of the skin in two cases are bare except the right hand of one and the left hand of a second, both so far as visible black; but both arms and hands of the third negress are visible, showing the hands black, but the arms white up to the shoulder except for "islands" of pigment. There can be little doubt that, although neither Professor Neisser of Breslau nor Sir Jonathan Hutchinson was able to obtain any particulars, this photograph really represents the *Three Striped Graces* of our Fig. 509. The fact that the three sisters are piebald, although they had normal siblings, seems to indicate that we have again a case of hereditary piebaldism. We are in the absence of any definite knowledge of the trunk leucosis unable to state whether these sisters should be classed as piebalds or spotlings. The arms of one of the sisters certainly suggest the former class as being most appropriate. The following points should be noted: (i) the masculine appearance and different dress of the centre figure, (ii) the fact that these Three Graces performed remarkable acrobatic feats, (iii) the boy of the "Leopard Family" (Plate XX (165)) has an acrobatic dress, (iv) the attitude of the arms is identical with that of the centre figure in Plate VV (158), (v) the leucotic patches visible appear to be of much the same shape and size in the figures of the two groups. We think therefore that there is some close connection between these two sibships, and doubt the leucodermatous character of Gould and Pyle's "Leopard Family."

The Nyassaland Piebalds. Our first knowledge of this case came through Dr Emslie, as shown by the photograph he sent us reproduced Plate H (21). We then owe further particulars to Dr Davey; next a very complete family account with additional photographs Plate RR (147)—(150) reached us from Dr Stannus to whom we are indebted for so much data bearing on African albinism. Finally (June, 1910) Dr Davey on a visit to England brought us specimens of the piebald hair, from the normal and leucotic portions of the scalp¹. The whole case is one of extraordinary interest and the bearings of it will be discussed after a consideration of the data. Some account is given under Pedigree Fig. 632 of this case but further data have since come to hand. We shall follow in the main Dr Stannus's account. The pedigree on p. 250 should replace that on Plate LII., Fig. 632, which it ex-

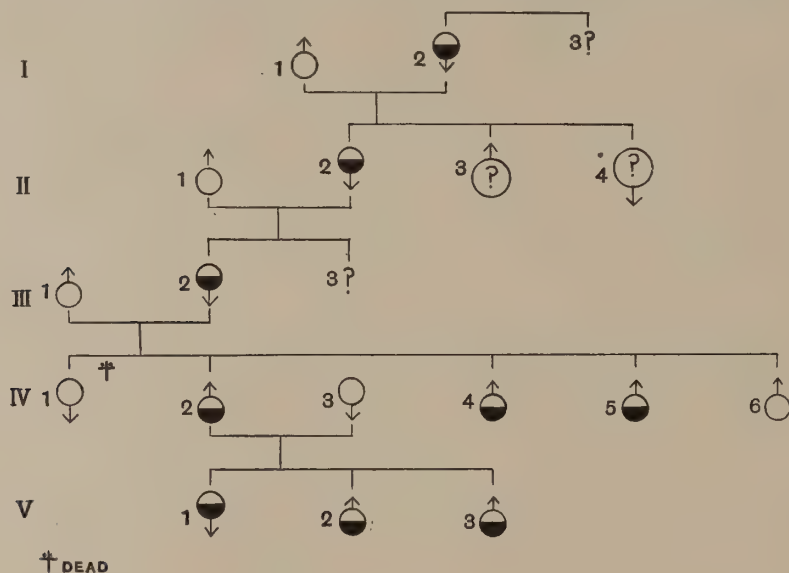
¹ These specimens will be discussed in our chapter on the Albinotic Hair. Meanwhile we may note that the normal wool from the scalp is packed with granules, but the light wool is truly albinotic, i.e. absolutely without granular pigmentation. In other words, these, and doubtless the bulk of other dark-skinned piebalds, are true partial *albinos*.

tends and modifies. The following key identifies individuals who appear in both pedigrees:

Fig. 632 ^{bis} (Text, below)	III. 2	IV. 2	IV. 4	V. 1, 2, and 3	III. 1	IV. 3
	=	=	=	=	=	=
Fig. 632 (Plate LII.)	I. 1	II. 2	II. 3	III. 1	I. 2	II. 1

III. 2 (centre figure of Plate H (21)) is Nyatombosia of the clan Achilwa, her husband being III. 1, Wakadodo Nyerenda, who is a normal, and of the average colour. III. 2 states that her mother, II. 2, and maternal grandmother, I. 2, were affected in the same way as herself; her uncles, II. 3, and her aunts, II. 4, were not affected, and of her great uncles and aunts, I. 3, she knows nothing. Her first child, IV. 1, a female,

Fig. 632 bis. *Pedigree of Florence Bay Piebalds, Nyassaland*



was normal and is dead; her second, IV. 2, a son, Sanloe (negro on left of Plate H (21)), has the flare; her third, a son, Chisuro, IV. 4 (negro on right on Plate H (21)), has the flare; her fourth, a son, Mayerheri, IV. 5 (Plate RR (148) and (150)), has the flare; her fifth, a son, Matthew, is normal. Sanloe married IV. 3, Mlasumivi, a normal negress (Plate RR (147) and (150)), and has by her three children at present: V. 1, Lucy, V. 2, Thomas, and V. 3, Chisianji (see Plate RR (150), (149), (147) with (150), respectively), all these children are piebalds, and have flare and comb in a more or less marked manner¹.

The description of Chisuro (presumably not Mayerheri?) provided by Dr Emslie was as follows (see Appendix, Fig. 632): "woolly black hair of the ordinary negro type except from crown to front, where there is a strip or 'comb' two inches broad of

¹ Even Lucy has the comb although it does not appear in a very marked manner on the photograph (Plate RR (150)).

yellow white. The eyebrows are normal, the eyelashes yellow white. The iris very light brown which is common enough. There is no nystagmus and vision is good. The patches are congenital, and it is said have not altered their contour, but increased with growth. The white marking is down the median plane, missing the face and beginning again on the chest...."

Of Nyatombosia (see Fig. (i), below) Dr Stannus writes: "white patch on epigastrium feels hardened and ?oedematous; it is covered with white hair. On arms markings which were originally white are now a reddish brown colour and skin appears thickened; on legs the marking is very patchy and irregular, the skin here seems normal and not hairy; irides dark brown, aged 50."

Of Mayerheri, aged 14, Dr Stannus writes: "white hair on scalp [presumably the comb, see Fig. (ii), p. 252], semi-curved white hairs on middle third of each shin; over shins patchy pink-white skin (?result of scarring). He has not altered in any way since birth; he is not hairy, axillary and pubic hairs normal; irides dark brown."

Lucy, aged five years, is the least markedly piebald; she is shown in Fig. (iii), p. 252; the white patch on right shin is covered with white hairs.

Thomas, aged four years, is shown in Fig. (iv), p. 252, and Chisianji, aged one-and-a-half years, in Fig. (v), p. 252; on the white areas of the knees of the latter are

Arrangement of Leucotic Patches on Nyassaland Piebalds from sketches of Dr Stannus.
The shaded areas represent the leucotic parts.

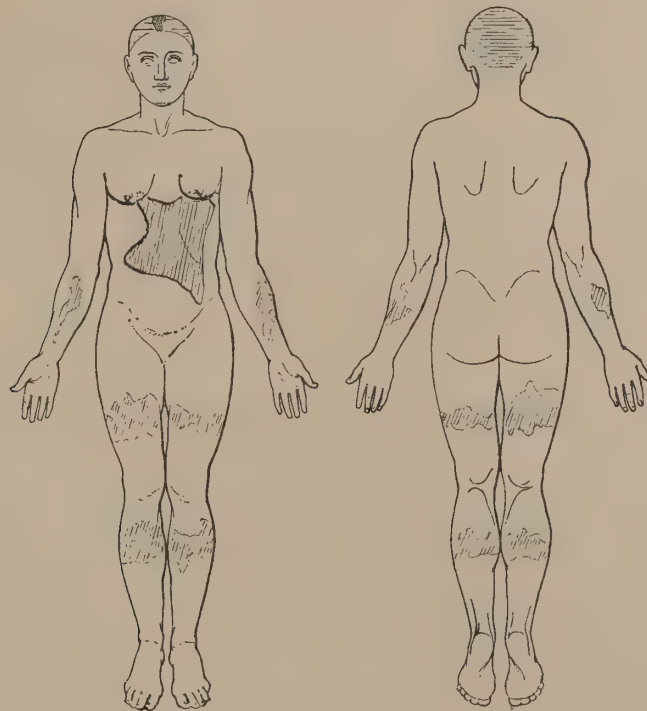


Fig. (i) Nyatombosia, aged 50 years.

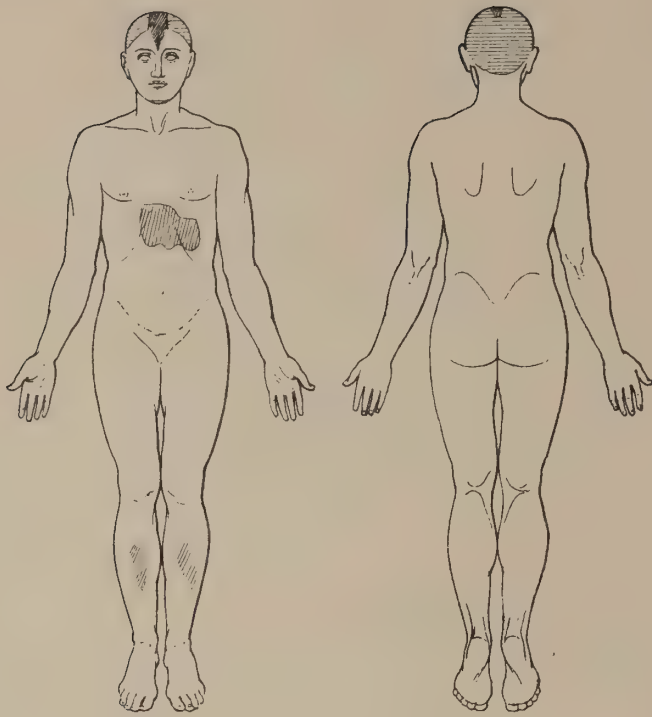


Fig. (ii) Mayerheri, aged 14 years.

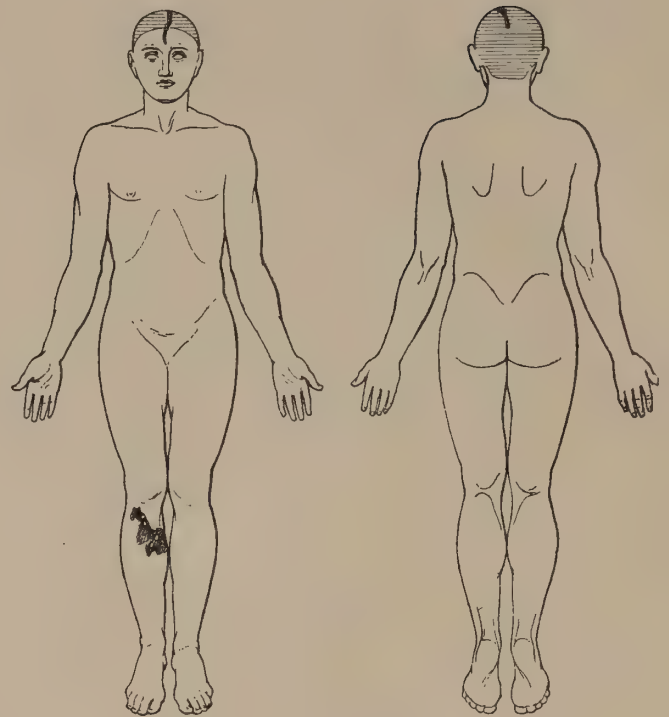


Fig. (iii) Lucy, aged 5 years.

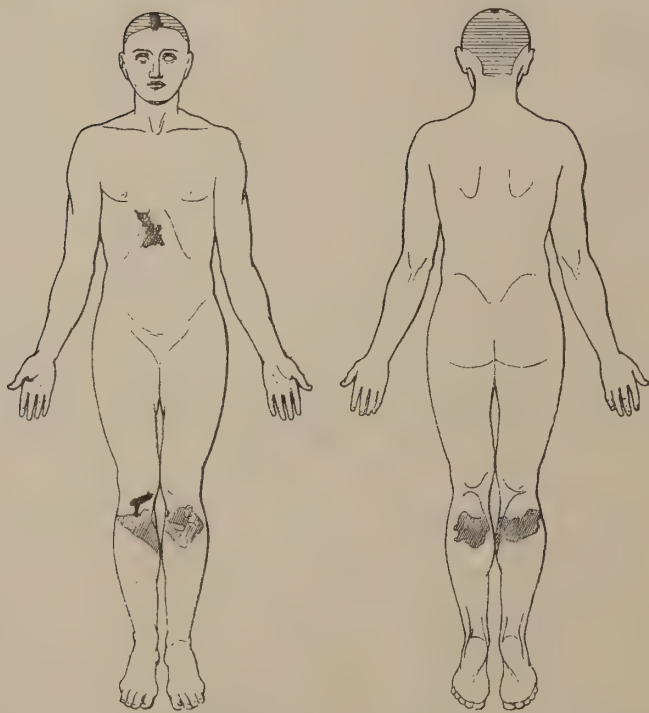


Fig. (iv) Thomas, aged 4 years.

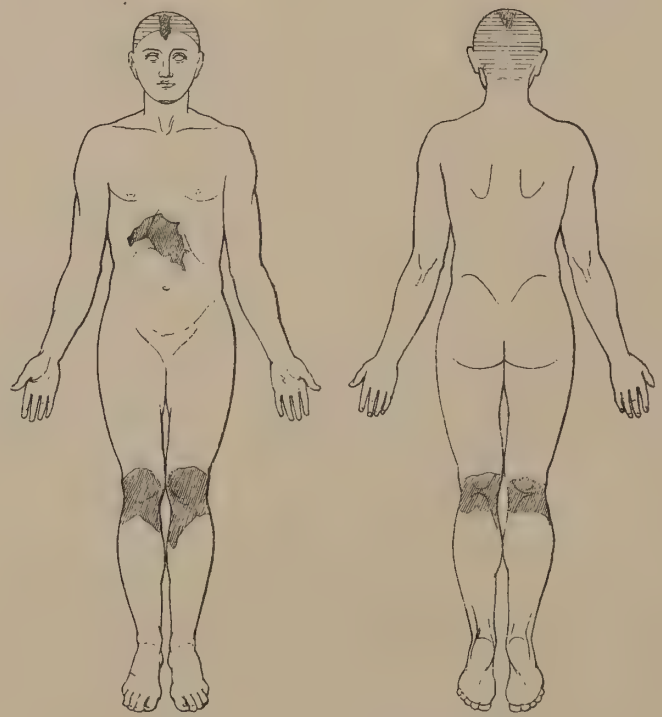


Fig. (v) Chisianji, aged 1½ years.

some light and dark brown spots $\frac{1}{10}$ to $\frac{1}{2}$ inch diameter (faintly observable on Plate RR. (147)); there are light golden hairs on the white patches.

We have no detailed account of Sanloe.

Dr Stannus remarks in general that the albinotic patches occur in the median line affecting the anterior half of scalp with attached hair, and encroaching on forehead to root of nose; there is a patch in epigastric region, and irregular broad garter patches on thighs, knees or legs. This applies to the five cases seen by him and is said to be true of the four members not seen. Albinotic patches of skin are covered with white or pale straw-coloured, semi-curved hair, elsewhere there is no hair on skin. The irides are dark brown in every case (? cf. Dr Emslie's account of Chisuro); vision good, no photophobia or nystagmus—but there was no ophthalmoscopic examination. Although full details are not given in every case, we have enough to show that this piebald family is marked by (i) the flare and comb, (ii) the epigastric patch (? Lucy), and (iii) the shin or garter patches. These may be accompanied by less definite patches on thighs and arms, or on the back of thighs, legs or arms, but these latter patches are by no means so universal or definitely localised.

This pedigree alone, if we had not come across heredity in other cases¹, would suffice to prove that piebaldism can be markedly hereditary and that this heredity largely extends to the position of the patches. The pedigree shows that piebaldism in man cannot be considered as "recessive," for this would involve the assumption that I. 1, II. 1, III. 1 and IV. 3 all had latent piebaldism—a very improbable assumption. If we assume it to be dominant, I. 2 and III. 2 must be taken to be hybrids (*DR*) for they have had some normal offspring. Further IV. 2 should be a hybrid (*DR*) because he had a recessive father, III. 1, and as he has a recessive wife, IV. 3, his children ought to be half piebald and half normal. At present he has three children, *all* piebald. The odds against this are at present 7 to 1, and the nature of further offspring will be awaited with interest.

A further important point about this Nyassaland family is the epigastric patch; but for this we should have found it convenient to class them as spotlings. With it they approach the transitional cases from spotlings to piebalds, although even in the case of Nyatombosia it is doubtful whether we can describe this patch as a large area of the trunk. In not a single case is any part of the back of the trunk affected.

B. *Spotlings.*

We have already defined the spotling as an individual with white markings, which do not extend to extensive areas on the trunk. The beginning of such trunk areas is almost invariably the epigastric patch, and it is in such cases that the distinction between the piebald and the spotling becomes indefinite. If the reader will examine our plates of genuine piebalds—Plate E (12), Plate J (28), Plate SS (153), Plate TT (154), Plate UU (157)—he will see that when the back of the trunk is given it is not leucotic. And this holds even for those cases where we have no such

¹ See Figs. 491, 509, 513, 529, 643 and pp. 248, 249, 254—5.

photographs but only descriptions of the patches (see pp. 251—2, Figs. (i)—(v)). Even when, as in Plate J (28), we see the leucotic area from the back, we might describe its centre as epigastric and the patch on the groin as an extension of this. The belly and breast are invariably the most marked parts (see especially Plates E, F, G, SS, TT and UU). This can hardly be said to be true of leucoderma (see Plates A, C, D, and less markedly, B and QQ). The genuine piebald as distinct from the spotling, or again from non-congenital leucosis, is a case of lighter pigmentation on the anterior side of the trunk. Now in this respect it is noteworthy that many mammals—as an illustration take the ordinary mouse—have, even if whole-coloured, a belly lighter than the rest of the coat, and most piebald animals start with an extension of the epigastric leucosis. It is quite possible that the human piebalds are intensified representations of a light-bellied quadruped, and that we have to deal with a case of palaeogenetic inheritance. Although the “flare” and the “stockings” and the “garters” are often in the human piebald associated with the epigastric leucosis, the latter, as in Gilbert Smith’s Case, can occur independently, and it seems to us that the ultimate origin of the two states may be as independent as they frequently are in domestic animals. A horse with blaze and white stockings is not usually termed a piebald, and this convenience of use may after all have a corresponding genetic significance. Of course the leucosis of the trunk and the extremities is combined in many cases, and the extension of the patches on the extremities may be such that, as in the case of some horses, it would be difficult to deny the name piebald. Transitional cases are represented in mankind by the Nyassaland family (see our p. 249). On the other hand, if a mere flare or blaze suffices to warrant the use of the word piebald, where is the limit to be set? Shall we term an individual with a white frontal lock, or a white patch on the nipple, scrotum, or penis, a piebald? It seems convenient to have a differentiated class and we have adopted that of spotling. It is from this standpoint to be borne in mind, that usually, although not invariably, the flare or white lock is inherited and does not appear as an epigastric patch in the next generation. This remark applies also to the stockings and white blaze of horses. On the other hand, the epigastric patch, as in the Nyassaland family, is also strongly persistent. At the same time, as Gilbert Smith’s Case shows, this rule is not universal and the spotling in one generation may be the father of a true piebald in the next. We can in the present state of our knowledge lay down no rigid rule, but, as in the case of mice, so we anticipate that in the case of man, piebaldism will be found not to be a unit character, but that the *extent* of the leucosis is hereditary.

White Spotlings.

Bishop-Harman’s Family of Spotlings. These points are exceedingly well illustrated in the remarkable family described by N. Bishop-Harman¹. This case is very fully described in our Appendix, Fig. 529, and Plate XLV. An excellent photograph is given on Plate H (22). This family is marked by a leucotic patch

¹ See *Trans. Ophthalmological Society*, Vol. xxxix. Fasc. (i).

which occupies the middle of the front of the scalp where it takes the form of a conspicuous tuft or lock of perfectly white hair; in some the whiteness extends well on to the forehead, and in one reaches almost to the root of the nose. In some members there is a single white patch on a distant part of the body. This family of spotlings has been followed for six generations. Of those of whom it has been possible to ascertain whether body patches exist, one is said to have had a white patch on each knee (the "garters"), another a triangular white patch on the abdomen, a third a patch round the navel, a fourth a white patch of skin over sacrum, a fifth a strip of white skin over the middle line in the lumbar furrow, and in the case of a sixth the lanugo on each calf is whiter than elsewhere (cf. Figs. (i), (ii) and (iv), pp. 251—2 of the Nyassaland piebalds. This family brings out essentially (i) the marked heredity of "piebaldism" even in its less intense spotling forms; (ii) the persistence of the "flare" and the tendency of minor spots to appear in the localities where we find them in completer piebalds, but with far less persistency.

Another white lock family with persistence for six generations is that of Rizzoli¹. This is again the case of a white lock on the forehead. Unfortunately we have not the detail provided by Bishop-Harman and we do not know whether body patches occurred. The occurrence of a deaf-mute in this family is of some suggestiveness, and its name, *Bianconcini*, may possibly indicate that the white lock has been handed down from quite mediaeval times.

One of the noteworthy points illustrated by both Bishop-Harman and Rizzoli's pedigrees is that this partial albinism—as distinct from complete albinism—must on the Mendelian hypothesis be treated as dominant and not recessive. Further it descends equally through male and female affected.

But it would not be justifiable to extend these conclusions to all cases of spotting. In Fig. 638 (Plate LIII. and Appendix, p. 110) is the pedigree of a well-known family with an occipital white lock, which appears to descend only through the females and occur only in the males². In this case, as well as in those of a

¹ See Appendix, Fig. 491 and Plate XLIII. A case of a family, all the members of which had the crown lock white is referred to by Bourke as occurring among the Cheyennes—American Indians—unfortunately without any detail: see Bibl. No. 606.

² A less reliable family history of white lock appearing apparently only in females ("One of my ancestors was born with a white lock on the left side of the head. That white lock appeared again on the head of one of my sisters, and I only learned within the last month that it has done so on the head of a grandniece of mine—always on the left side where the cocked hat soldiers wore it") was given in the *British Health Review*, Jan. 1910, p. 40. We have tried—in vain—to get in touch with the writer. A further case was hinted at by Hodgkin (*Lancet*, Dec. 6, 1862, p. 619): "In a certain noble family, every member had a lock of hair of a lighter colour than the rest on the top of the head." Cases of a white lock, or a more extensive area of white hair on scalp, which have been classed as *poliosis circumscripta* are too numerous for even a list of recorded cases to be made here. Attention may be drawn to some few principally of historical interest. Cassan notes a girl of 15 with lock of white hair on forehead in midst of ordinary brown hair—? appeared gradually—but the cause said to be hereditary in family (Bibl. No. 181, p. 75). Eble mentions a silk-merchant in Verona, who with his two sons had half white and half black hair on the head. He mentions further the following cases, a man, described by Vogel, with white hair on one side and brown on the other; another with a white tuft on one side of the head; a girl of eight years with one side of the head straight black hair,

white-locked (frontal shilling patch) father and son known to one of us, the skin under the patch showed no sign of pigment differentiation.

Two remarkable cases of spotlings have been recently recorded by C. H. Usher and N. Bishop-Harman respectively, and deserve notice here.

Usher's Case. In this case, a girl (Appendix, Fig. 562, Plate XLVIII., photograph Plate I I (109)) we have a pedigree of marked blondism. In the last generation the brother of this girl is described as having light brown hair, blue irides and fundus indistinguishable from that of an albino. There is, however, no nystagmus. In the girl herself all the left eyelashes (upper and lower) are white, together with two tufts of hair on L. side of scalp (parietal and occipital regions), and two or three small spots of skin on the L. forehead and one on R. forehead; irides blue and fundi not specially light, and no difference between R. and L.; parents say that in infancy the eyes looked red in certain directions. The white eyelashes and tufts of hair were noticed about three days after birth. Child born at full time, labour normal, no instruments; now aged three years, and normal in every respect except the white hairs. No alteration of texture of the white spots of skin. Many members of the pedigree (five generations) fair, and one (father's father's mother) was called "the Circassian" because especially fair, but none appear to have been definitely albinotic. The case is of special interest as marking an apparent relation between blondism and partial albinism¹.

Bishop-Harman's Case. The Jewish girl² in this case belongs to a group where congenital whiteness of the skin is strictly limited to one side or when bilateral is

and the other light curly hair; lastly he knew a case where each hair was half white half brown (Bibl. No. 196). Bartholin also knew a boy with a half white, half black head of hair, and Paulinus records the case of a woman who from puberty had white pubic hairs (Bibl. No. 40). Devay records a boy of twelve, son of first cousins, who had a mixture of black and white hair (*une chevelure panachée*) (Bibl. No. 284, p. 31). Cornaz records two cases of white locks from birth (Bibl. No. 256, p. 326). Virchow mentions a German "Gelehrter" with a white "comb" (Bibl. No. 437), and Blanchard a well-known Paris surgeon with a white lock on the forehead (Bibl. No. 415). There is also an English case in which the name of the family appears to have been taken, like that of the Bianconcini, from the hereditary anomaly, but particulars are not so far procurable. K. Pearson reports two children, a brother and sister, an Oxford undergraduate and the wife of a well-known professor in whose case it was hereditary, all with white locks. In many of these cases, however, the congenital, still less the hereditary character, has not been demonstrated. Injuries, illnesses and shocks have been known to produce white hair, but the light which such artificial leucosis would throw on true albinism might be quite as intense as that of true congenital cases. Cassan reports a case of complete change of hair colour, accompanied by an eruption on scalp, forehead and chest, in the case of a female aged 33, agitated by having to give evidence at a trial; when the eruption subsided the hair remained white (Bibl. No. 181, p. 75). Bonnet gives an account of the apothecary Escaillon, a man of strong constitution, aged 45—50, who was accused in the time of the French Revolution, and although not guilty was compelled to fly. He fell, apparently dead, on the ship he was flying on, and his brown complexion and black hair became permanently white (*Annales de la Soc. de médecine prat. de Montpellier*, T. XXII. p. 109).

¹ See Bibl. No. 549. Lebert cited by Cornaz (Bibl. No. 256, p. 327) had also noted cases. Von Ammon (*Zeitschrift für Ophthalmologie*, T. III. S. 515, Dresden, 1833), has noted white eyelashes in black races. Whether such cases were in early days distinguished from the effects of irido-cyclitis, etc. is not clear: see Bibl. Nos. 329, 390 and 435.

² See Bibl. No. 548.

regularly symmetrical and corresponds in distribution to the territory of a cutaneous nerve or nerves. These cases are distinguishable clinically from morphoea or linear atrophy by the absence of any change of texture in the affected skin and by the alteration having been present from birth. To similar unilateral or bilaterally symmetrical cases as occurring in leucoderma, we have already referred (see pp. 203 ftn., 223 and cf. Case (7), p. 246). Bishop-Harman has kindly given us photographs from which the illustrations Plate J (29) and (30) have been reproduced and supplemented his published account with further particulars. The subject was a Jewish girl of dusky brunette complexion. The area affected corresponded to the distribution of parts of the 1st, 2nd and 3rd divisions of the left 5th cranial nerve and of the 2nd and 3rd cervical nerves. There are tufts of white hair at each of the places where the patch reaches the scalp, but the whiteness does not extend into the scalp skin; the median boundary on chin and neck is somewhat in shadow on the photographs but is in reality quite sharply defined; the whole of the eyebrow and all the eyelashes are white, except a small pencil at outer canthus, to which point the normally coloured skin just reaches¹; there are several small normally pigmented islets on the forehead. The white areas have exactly the same texture and sensibility as the skin in general. The teeth and mucous membrane of cheek and tongue show no deviation from the normal. The child was examined all over and no patches found on any other parts of the body. None of the other members of the family had any markings. The ophthalmoscopic appearance and colour of iris (brown) were the same in both eyes. Had there been any trunk patches, the largeness of the facial leucotic areas would have justified this case being classed as piebald. It is a borderland case between spotting and piebald¹.

It would not be to our present purpose to form a list of the very numerous cases in which congenital white patches other than those associated with white locks, flare or epigastric patch have been noticed in Europeans. Phoebus, a fairly early (1834) medical writer on albinism, had himself such a congenital spot on his ankle². Bärensprung reports a male case in which from the earliest youth there had been a want of pigment limited to the back of both hands³. He also records⁴ the case of a man with a small patch (as big as a thaler) on the right shoulder, and a still smaller one on the left, but the only other patches were on the head and were accompanied by locks of snow-white hair. Hutchinson and other dermatologists refer to cases with smaller leucotic patches, occurring very often on the more deeply pigmented parts of

¹ Dr T. Snowball has kindly sent us details of the case of a policeman, G. S., aged 38, with white eyelashes, the central $\frac{3}{5}$ of the left upper lid, the rest black; except for four definitely white hairs in the centre, the left lower lid is black. White hairs are found in the left eyebrow and the left half of the moustache (four hairs). The white hairs appeared, according to the patient, suddenly, $2\frac{1}{2}$ years before Dr Snowball's record. The case sounds like one of leucoderma. One sibling, a sister, has a tuft of white hair on the right side of her head, said to have appeared after an attack of measles when she was four or five years old. The patient has four living and one dead sibling, but neither patient, nor his sister, knows of any other pigmentation abnormality in the members of their family. Whether leucoderma or not, the case illustrates that acquired leucosis may tend to run in a family.

² See Bibl. No. 207, p. 126.

³ See Bibl. No. 257, Case (ii).

⁴ See Bibl. No. 257, Case (iii).

the skin as on nipple or scrotum¹. We shall see other definite cases of this type when we deal with negro spotlings. Our own albinotic pedigrees exhibit a number of instances of spotlings among European as well as among the dark races. Thus a girl, III. 7 in Pedigree, Fig. 104, seems to have the beginnings of an epigastric patch; isolated white locks or other characteristics of partial albinism will be found in the members of a considerable number of stocks producing albinos: see Fig. 51 (III. 6, a tuft of nearly white hair on right temple); Fig. 106 (III. 4, a white lock father with four albinotic daughters); Fig. 234 (the mother, I. 2, of five albino offspring, had a congenital white patch of hair); Fig. 191 (the father of an albinotic boy, and two of the father's brothers had white eyebrows); Fig. 256 (II. 4, with white hair but normal eyes, having an albino nephew and niece); Fig. 257 (II. 12a, originally white hair, eyebrows and lashes always white, had three albinotic grand-children); Fig. 364 (maternal uncle with white lock, nephew, IX. 8, with hair without granular pigmentation, but also with albinos on paternal side); Fig. 409 (albino, IV. 2, with partially albinotic mother); Fig. 484 (congenital white lock, IV. 4, and three other partial albinos in a stock with three complete albinos, see our Plate N (41) and (43)); Fig. 543 (white forelock in III. 2, the sister of one and the niece of a second albino). These cases, emphasised as they are by a number of similar cases in the dark-skinned races, seem to indicate that partial albinism, relatively rare as it is, appears to be less rare in stocks with completely albinotic members than among normal stocks.

We have seen that some appreciation of the frequency of pigment anomalies may be obtained from Dr G. A. Turner's data, who found between 0·3% and 0·4% among 7089 negroes (see our p. 116). At the same time no light locks are included in Dr Turner's table, but he found among 486 negroes (see our p. 117) 4·9% with light down on the temples—this possibly indicating the beginning of a "comb." A maximum limit to the occurrence of pigment anomalies has been most kindly provided for us by Dr D. W. Hunter. He has examined for such anomalies 388 male and 217 female imbeciles at the Royal Albert Asylum, Lancaster. Of these 14 males and 4 females exhibited pigment anomalies, or 3·0%—there being a considerably greater number of males than females; it is possible, of course, that a more complete inspection of the boys has been made than in the case of the girls². We speak of these numbers as a *maximum* limit (*i.e.* in the case of the boys) because we have reason to believe (see our Chapter on the Relation of Albinism to other Defects) that all anomalies, and especially anomalies of pigmentation, are more frequent with imbeciles than with the general population. Dr Hunter most kindly accompanied the most marked cases by photographs. The anomalies are as frequently in excess as in defect. They may be classed as (i) excess of pigment, or large moles, (ii) leucotic areas, (iii) white locks, and (iv) abnormally light pigmentation.

A. *Excess of Pigment*³. Case (1). C. S. P., ♂. Aged 22. Pigment spots on left

¹ Cf. cases described on our pp. 208, ftn. ⁸, 258 et seq. and in our chapter dealing with the relation of albinism to other defects.

² The girls were examined by two very competent nurses, who knew what to look for and did their work very thoroughly.

³ *Forty-two* other cases showed slighter pigment spots, irregular pigmentation (only two possibly leucotic), or specially emphasised pigmentation—all among boys.

side and back, fairly numerous and in diameter from a few millimetres to two or three centimetres. It is probable that the pigmented areas in this case are due to scratching.

Case (2). T. A. P., ♂. Aged 37. Has three hairy moles on left side of face, one over left frontal eminence, one over the eyebrow and one on the front of the ear. One similar mole on right lower jaw. There is an extensive brown area of skin, commencing behind at the middle of the back, and in front below the umbilicus; and extending downwards in front and behind nearly to the knees. This surface is mostly covered with fine hairs, but these are not evenly distributed. Over the left arm there is a raised surface from 2 to 3 inches diameter, somewhat resembling in character a fatty tumour; there is a similar but smaller tumour over the left buttock. The right buttock is markedly smaller than the left and projects more when he stoops. The boy has a peculiar animal-like odour, probably due to the brown surface above described. There are a good many hairy moles scattered over the body generally.

Case (3). R. W. V., ♂. Aged 22. Large heart-shaped pigmented area in centre of back between shoulder-blades, running up over the left shoulder and also joined in the median plane to a darker area on the neck.

Case (4). Jp. A., ♂. Aged 19. Five or more pigment spots, an inch or so in diameter, situated about over crest of left ilium, and small naevus on back.

Case (5). Jn. A., ♂. Aged 17. Ten or more deeply pigmented spots in lumbar and sacral regions, more on left side than right; one over left scapula and one over front of left shoulder joint. The largest of these probably $4'' \times 3''$, and others an inch or more in length. Two similar spots above navel. The case is of interest, for recently the boy developed scarlet fever, and there were several small areas on the chest in which no rash appeared, indicating some anomaly of cutaneous circulation.

Case (6). W. S. B., ♂. Aged 21. Large pigment spot over lower angle of left scapula, about $3''$ diameter. There is also irregular pigmentation on the left side of the abdomen.

B. *Leucotic Areas*. Case (7). H. A., ♂. Aged 20. A large leucotic area irregular in outline about $5\frac{1}{2}'' \times 5''$ in left epigastric region, extending exactly to the median line, and generally rectangular in shape. From this abdominal area a second patch, oval in outline, about $2'' \times 1''$, extends round left side. In the leucotic areas are several small patches of pigment varying in size, as a rule about $\frac{1}{4}''$ in diameter. The rest of the body deepens in pigment and becomes very dark as we approach the leucotic areas. The leucosis is not a matter of contrast with the general over-pigmented condition of the abdomen. The hair is fair, but not abnormally so, the eyes are a blue grey with a little pigment round pupillary margin¹.

Case (8). H. E. B., ♂. Aged 22. Irregular pigmentation of the abdomen, with dark areas and a leucotic patch on right of scrotum.

Case (9). R. H. E., ♂. Aged 42. Moral imbecile. Widely extended leucodermic patches over trunk, neck, arms and legs.

Case (10). M. E. J., ♀. Aged 18. Has a leucotic patch on left side of neck.

¹ This case for extent of patch is almost comparable with Dr Gilbert Smith's case: see our p. 246 and Plate J (27) and (28).

It is difficult to photograph, but shows up much better after a meal owing to the flushing of the skin.

C. *White Locks*. Case (11). T. H. H., ♂. Aged 19. Several white patches of hair on both sides of a head of fairly dark ash brown hair. Microscopically examined, the normal hair has a decided number of granules¹ (γ) and pale brown diffused pigment; the white hair has no diffused pigment and no granules, *i.e.* is entirely devoid of pigment.

Case (12). E. C., ♀. Aged 8. Mongolian imbecile. Long white tress springs from over upper part of right frontal bone and falls over right side of face. The normal dark hair has plenty of granules (δ) and brown diffused pigment; the white hair has no diffused pigment and is without granules, *i.e.* has no pigment of any kind.

Case (13). C. C. D., ♂. Aged 10. Has a wedge-shaped "comb" of white hair. This "comb" is hereditary: see Extra Pedigrees, in Appendix A. Microscopically examined the dark hair shows very plentiful granules (ϵ) and brown diffused pigment; the white hair shows vacuoles, no diffused pigment and no granules.

Case (14). R. G., ♂. Aged 20. Doubtful Mongolian imbecile. Has patch of light coloured hair about an inch in diameter on crown of head. The darker hair has very plentiful granules (ϵ) and yellow brown diffused pigment. The lightest hair has no diffused pigment and no granules, but there are very few such hairs in the light patch. Between the dark hair and the lightest is a shade which has very pale diffused pigment, and plenty of granules (δ). Dr Hunter writes: "Within probably the last two or three months, certainly within the last six, this patch of lighter coloured hair was quite white, and I was rather surprised the other day when going to look for it to find that it had become almost as dark as the surrounding hair." There is no doubt of the completely albinotic condition of a part of the sample of hair sent, and it would seem possible that the extent of this patch of albinism varies.

Case (15). T. A., ♂. Aged 16. A patch of light coloured hair about 1" in diameter on crown of head. The rest of hair is a dark brown. Microscopically the dark hair has plenty of granules (δ) and light brown diffused pigment; the light hair has a slight diffused pigment and some granules (β). It is thus not completely albinotic as in the previous cases.

We now note three special cases:

Case (16). C. A., ♂. Aged 8. This boy has the fairest hair of the 432 patients at present in the institution. Macroscopically it is the palest silver or ash brown, and, notwithstanding, it is said to have darkened during the last year. Microscopically examined there is a very slight diffused pigment, and a very few faintly marked granules (α). The boy's hair would therefore in many cases have been passed as clinically albinotic, if the eyes had been albinotic (see our Chapter on the Albinotic Hair).

Case (17). N. D., ♀. Age ?. The fairest hair of all the girl patients, 238 in number. Macroscopically the hair has far more colour than that of Case (16). Micro-

¹ See Chapter on the Albinotic Hair for the scale of granular pigmentation (α , β , γ , δ , ϵ , ζ) used.

scopically examined the hairs are found to be of two kinds. One kind, the darker, have a pale yellow diffused pigment, but a decided number of minute granules; the other, the lighter kind, have no diffused pigment and no granules whatever, but vacuoles. It is thus truly albinotic. This case corresponds accordingly to those which are recorded in our Chapter on the Albinotic Hair in which there is an actual mixture of completely albinotic with non-albinotic individual hairs.

Case (18). L. G., ♀. Age ?. A spinning idiot¹. Eyes bright blue, no specks of pigment to be discovered. Ophthalmoscopic examination impossible owing to extreme restlessness, and violence if restrained. Examined by the nurse in the dormitory alongside all the other girls, and reported by the nurse as having by far the fairest skin—there being “no comparison.” She is in good health and not anaemic. The sample of hair sent was a dull dark brown but streaked with bright lighter patches. Microscopically some hairs are lighter than others; the darker contained very minute but numerous pigment granules, the lighter shades had similar granules but not so numerous. It would appear that this may be a case of incomplete albinism.

Dr Hunter kindly examined the books of the Royal Albert Asylum for several years with regard to the pigmentation of inmates. In the case of 1959 males, two approached the albinotic condition, and nine were classed as being remarkably fair; in the case of 1077 females none were classed as albinotic but four as having remarkable fairness. Of the two males who approached the albinotic condition, one is merely described as “almost an albino, hair nearly white” with no further information, the other as a “partial albino.” The information given is: “Fundus glare visible; nystagmus; eyelashes almost white. The patient seemed all right up to 8 years of age, and then gradually became demented. Died 3 years after admission, hydrocephalus, atrophy of brain; lungs, however, widely affected with tubercle.” It will be seen that one albino per 1500 imbeciles is much in excess of the general rate of albinism, and if we add in pigment anomalies in 3.0% of cases it seems probable that there is a real relation between imbecility and abnormal pigmentation². This will be discussed later in the present work. Meanwhile it seems not unreasonable to suppose that cases of white locks or white patches do not occur in the general population with such frequency as we find them in an imbecile population. The values for the latter are probably a maximum limit to their occurrence generally, and this is consistent with Dr Turner's number, 0.4%. Actually Dr Hunter's data provide “spotlings” in about 1.3% of cases.

Spotlings in the Dark Skinned Races.

We will start with the Negro for whom our records provide more ample data than for other dark races. We have already noted that in spotlings the leucosis not infrequently selects the normally darker areas of the skin. Thus Dr G. A. Turner of Johannesburg reports³ that he saw on the 12/1/08 a Myambaam (W. N. L. A.

¹ Cf. *Biometrika*, Vol. VII. p. 247.

² One imbecile in the Royal Albert Asylum has two albino siblings.

³ Letter to C. H. Usher, Nov. 15, 1908.

No. 31,022) with a dead white patch about the size of a shilling round each of his nipples; there were no leucotic patches elsewhere at all. He had also paid special attention to leucoses in association with the genitals of natives, and is "sure they are more prevalent over these parts than others." Thus for example a Mytopi boy (No. 31,161) had the inferior half of his scrotum quite white, and also the corona of his penis, the rest of his body was quite black, but these parts were dead white. An illustration of another Kaffir boy with leucotic penis is given on our Plate AA (85). This photograph is also due to Dr Turner. We owe to Dr Turner a further case of leucotic glans penis in a South African circumcised native (see our pp. 119 and 123 ftn.). In this case the specimen was placed at our disposal and has been microscopically examined by Dr W. Bulloch¹. A more complete spotling is Dr Turner's Mytopi, (W. N. L. A. No. 29,660), who has a white glans penis and also white leucotic areas over both legs (see our Plate HH (106) and (107)). This boy assured Dr Turner that he was born with these patches, and Dr Turner remarks that the "statement is probably true, but of course one can never be sure of anything a native tells you in such matters." The patches are very similar to those we have already noticed in the Nyassaland piebalds, and there seems no reason to doubt their congenital character; they are not such as one is familiar with in leucoderma².

Arthaud, as early as 1789, reported³ the case of a negro with a white penis, and Isert saw in 1785⁴, at "Fida" on the coast of Guinea, a negro with white hands and white feet (*tout-à-fait blanches*), who, he states, was born so, and differed in this respect from a dwarf leucotic negress, who had become white as the result of a severe illness. Another good illustration of a spotling is that of the Bantu Alfonso Mvelele reported by Dr Mercier Gamble⁵. He had a white scrotum and both hands were patched with white, *e.g.* the backs of some of the fingers were white. His face was pale, but Dr Gamble says that this paleness is by no means rare in the Bantus of the Congo. This man by a normal negress had two completely albinotic children (see our Fig. 544 and Plate EE (97)). His wife, however, must have had albinism latent in her stock for, by a second husband, she had a son with a white tuft of hair on a white patch of skin. This pedigree well illustrates the links between complete and partial albinism.

Further instances of the dependence of these two classes of albinism are to be found in our pedigrees: Fig. 269 (a partial albino associated with completely albinotic siblings); Fig. 643 (two negro piebalds with a full cousin a complete albino); Fig. 427

¹ See the Appendix to this Chapter, pp. 265-6.

² Another singular piebald is referred to by Dr Turner in a letter to K. Pearson (Jan. 11, 1909). "I have another peculiar type now in my compound, he is not a pure albino, but he cannot be called a case of xanthism; he has pure white spots of no great extent, but he has large areas, covered with what may be described as a white background, on which have been implanted numbers of *black* freckles." Further details and photographs are not yet to hand.

³ See Bibl. No. 108, p. 278 and our p. 239, ftn.

⁴ See Bibl. No. 98, p. 199.

⁵ Letter to K. Pearson, Jan. 8, 1909.

(a case in which pigment¹, other than freckles, seems to have developed in an albinotic negro whose eyes were always pigmented, there being two albinos in the stock). Other instances in dark races of albinism of various grades being associated will be found in the Philippine pedigrees, Figs. 613—627. In Fig. 419 we have from Celebes six albinos associated in a stock, with a child having a pigmentless spot on the head, and a man with white patches on the hands. Of even greater interest is the Hindoo family, Fig. 128, with two complete albinos and a maternal uncle with dark hair but white body, which Dr Pearse considers is *probably leucoderma*. A parallel to this case exists in Dr Seligmann's Papuan family, Fig. 425, which contains a woman who had originally a very light skin, and is described as having developed very marked *leucoderma* from the age of 15 onward.

Now the above cases and those we have cited for the white races (p. 257) would not be sufficient by themselves to demonstrate definitely a link between complete albinism, partial albinism, and leucoderma; but they emphasise the great importance of keeping a very full record of all cases of leucosis, and seeking carefully for leucotic patches in albinotic stocks. It is not a mere suggestion thrown out at random, but one with a certain weight of evidence behind it which demands attention, when we say that it seems possible that the stocks which have latent albinism are the stocks which are likely to produce partial albinos, and that such stocks with a tendency to pigment-upset will very probably be more susceptible to leucoderma. From this standpoint we must notice what has been referred to as the quite unique family described by Dr Joseph Jones: see our Fig. 286. This stock combines cases of complete albinism with those of congenital spotlings or piebalds, of progressive leucosis or leucoderma, and of apparent xanthism. If we accept its evidence—and Dr Jones writes with caution and appears to have observed carefully—we must conclude that a family can have a constitutional tendency to pigment-upset, which can take any one of the above-mentioned forms. This is only unique in that our other pedigrees solely show albinism linked with xanthism, or albinism linked with the pied condition, or albinism linked with leucoderma, and not a combination of all these conditions in one stock. The account given by Dr Jones is abstracted in our Fig. 286. The negress, I. 1, with white spots on arms and legs which increased with age, had progressive leucosis, which could hardly fail to be leucoderma; her six daughters had apparently congenital white patches, but the seventh first developed them when 40 years of age. She (II. 4) married twice, and by the first marriage had a daughter (III. 2) with a few white patches on arms and thighs; this daughter married a normal negro and had two sons, of whom the description is such that both as to eyes, hair and skin, they were undoubtedly complete albinos. The second marriage of II. 4 produced a son, also a spotling, and he had a light brown or xanthous offspring.

On account of the great importance of this case we have reproduced Dr Jones' illustration of the woman, IV. 2, with her albino child: see Plate XX (168). A comparison of this with (167) on the same plate, Dr Jones' picture of the "spotted

¹ This case is comparable possibly with the Hindoo brothers in Fig. 129, one of whom is described as completely albinotic and the other as having certain pigment patches.

negress," Lemisa Bert (see our p. 204), shows conclusively that he knew perfectly well the difference between complete albinism and partial leucosis. The original print of Margaret Aikins (IV. 2) and her albino son is not very good and shows whitish patches on forehead and hands of mother, which are, however, due to reflection of light from the glossy skin. Dr Jones writes of Margaret Aikins that she was a "stout hearty negro woman, with glossy skin and hair, cheerful countenance and kind disposition. Features more regular and nose somewhat more prominent than usual with negroes. The photograph presents a good likeness of this woman with her albino child in her arms. Age 26. She has a few perfectly white spots on the arms, and says that similar spots exist upon the thighs. The contrast between the dark skin and the milk white spots is very striking. The white spots are irregular in shape, and about three-tenths of an inch in diameter."

Now while Dr Jones' pedigree is unique in its range of combinations it is not unique in its several details. In Fig. 272, Dr Heath provides us with a pedigree in which xanthism appears associated with complete albinism and possibly incomplete albinism—a negro with red hair and grey eyes. Fig. 278 shows that the historically famous albino negress, Genevière, had apparently a xanthous brother, or one born white, who darkened with age. Fig. 288 gives Dr Fermin's case—one also of much historic interest—in which two completely albinotic negro siblings had two abnormally light mulatto coloured brethren. Fig. 643 links complete albinism with piebaldism. Finally, to confirm these classical cases we have the recent pedigree (Fig. 441) of Jappe due to Dr G. A. Turner, showing the intimate association of xanthism and albinism (see our p. 115).

When we consider the relative rareness of complete albinism, of the spotted or splashed condition and of xanthism, their relatively frequent coincidence in the same stock suggests that these abnormal pigment conditions are not wholly independent, and that as a working hypothesis it is reasonable to suppose that complete albinism, partial albinism, incomplete albinism and xanthism, all static forms of leucosis, are phases of the same process and are probably linked with leucoderma and possibly other forms of dynamic leucosis¹. By "linked" we suggest that they mark the complete, incomplete, local or progressive failure of the same metabolic process, which may never start at all, never start in certain areas, or be imperfectly started, and again being started may fail to maintain itself; further that every variety of

¹ Statistically we may note the following points. We inquired for all forms of congenital leucosis,—complete, incomplete and partial albinism. A summary made shortly before we closed the plates of pedigrees, gave 528 completely albinotic sibships and 279 incompletely or partially albinotic sibships. Thus sibships with complete albinism were about twice as frequent as the imperfect forms. Thus, if the two categories were independent, we should expect their coincidence in one sibship to be less frequent than the appearance of an albino family in the general population. Yet of 528 albino sibships extracted from the first plates printed off, 144 contained also imperfect albinos, or 25 % of sibships with complete albinism showed also incomplete or partial albinism. Out of 600 pedigrees 75 % contained complete albinism only, 11 % incomplete and partial albinism only, and 14 % combined the two, or about 16 % of albinotic pedigrees show incomplete forms of albinism on this wider series. These results seem wholly incompatible with the complete independence of the two conditions.

this failure may individually or collectively be associated with certain stocks, which may either show hereditary failure of one phase, of several, or exceptionally of all phases of pigment metabolism. In albinism as in many other defects we find equivalence or interchangeability of heredity. It is from this standpoint that we have considered it desirable to deal at length in this monograph with both leucoderma and piebaldism, for we are fairly confident that not only a thorough knowledge of the source and distribution of these will throw light on albinism, but that an actual understanding of the metabolic defect which is the origin of albinism would in its turn account for both leucoderma and piebaldism. We can only hope that our labour in collecting published and unpublished material in these directions will lead to a fuller recognition of the important points with regard to them which urgently need, from the standpoints of pathology, physiology and genetics, further investigation¹.

¹ In this chapter we have confined our attention chiefly to partial albinism of skin and hair; partial albinism of the eyes will be dealt with in the following chapter. Some remarkable cases of partial pigmentation—not incomplete pigmentation—of the hair may be noted here. Foremost among these attention may be drawn to Dr Heron's deaf mute albino, discussed in our Appendix, Fig. 649. His skin is completely albinotic; this is well brought out in the original of our photograph, Plate OO (137), where the whiteness of the boy's skin is markedly contrasted with that of the other boys in the group. In our reproduction much of this, but not the albinotic characterisation, is lost. His hair is completely albinotic with the exception of a black tuft on the back of the head (see Plate OO (138)) and a few smaller tufts, some consisting of only two or three black hairs. The albinotic hair is, when microscopically examined, absolutely devoid of pigment, but the black hair abounds in granular pigmentation. Similar cases of isolated dark hairs containing granular pigment have been found in other cases of apparently complete albinism: see for example our Fig. 41. Allied to these instances are those in which isolated pigment patches occur in the fundus, iris or skin of albinotic individuals: see our p. 6 ftn. Such cases are of extraordinary importance as indicating how difficult it is to regard albinism as the general absence of a ferment, and not as a complete or local structural differentiation which prevents the possibility of some normal metabolic process.

APPENDIX TO CHAPTER VI.

Report by W. BULLOCH, M.D., on the Penis and Scrotum of a South African Native with white glans penis, although circumcised. The specimen was given to the authors by Dr George A. Turner of Johannesburg, April 6, 1909².

The organs are those of an adult male and comprise the scrotum and penis. Both are almost of a black colour. The prepuce had been circumcised. It was apparent that the glans penis both on its upper as well as its lower surface was piebald, *i.e.* there were black spots on a relatively colourless background. On examining the dorsal surface more closely four such spots were evident. The first began at the corona glandis over a base measuring six millimetres. From this the dark area was continued towards the median line gradually tapering to an apex six mm. from the base. Immediately at the apex the pigmented area opens into a diamond shape which projects backwards again touching the corona while it is continued towards the opening of the urethra: see Plate μ . The extreme length of the diamond-

² On the blackening of the *glans penis* of the negro after circumcision see the remarks of Dr Turner, p. 119, and of Dr Strachan, ftn. p. 123 of this monograph, also S. G. Shattock, "Pigmentation of the glans penis in the negro after circumcision," *Trans. Path. Soc. London*, Vol. XLIII, pp. 99—103, London, 1892. For a case of congenital leucosis of the penis of a negro: see Plate AA (45).

shaped area was 9 mm., its width being 5 mm. The second black spot was rounded in shape, sharply circumscribed and occupied the left upper and outer quadrant of the glans right up to the corona. The third spot, about 4 mm. in diameter, was more or less circular and occupied the tip of the penis down almost to the opening to the urethra. On the right side of the dorsal surface of the glans and lying just in front of a line equidistant between the corona glandis and the urethral opening was the fourth spot which was continued round the side of the glans and appeared as a larger area on the under surface of this part. In addition, the lower surface of the glans presented two other deeply pigmented areas, the one corresponding to the region of the fraenum and continued forward about half way to the urethral opening. The other pigmented area lay lateral to this and was both wider and longer. The lower surface of the glans presented therefore three pigmented areas of which one was median, the other two lateral. The lateral areas, unlike the median, were not continued up to the corona glandis but stopped a few millimetres in front of it, leaving in this way an unstained area. In comparison with the black penis and scrotum the condition of the glans presented a striking appearance. Dr G. A. Turner, who obtained the specimen, writes to the effect that during life the unpigmented areas of the glans were white, but that after it was preserved in formalin a change of colour took place, associated with darkening. Even after being many months in formalin the contrast between the black spots and the clear area was instantly apparent. An excessive strength of formalin had been used so that the organs were over hardened and were found very difficult to cut, especially when embedded in paraffin. For this reason the majority of the sections were cut by the gum method. They were obtained, however, sufficiently thin for use with a $\frac{1}{12}$ oil immersion lens. A disturbing factor was also encountered in a brownish deposit which occurred in the deeper parts of the sections from the prolonged use of the high concentration of formalin. With the help of Verocay's method, however, this was largely, if not completely, eliminated. Sections were made chiefly of the tip of the glans and involving the circular area on the dorsum and the spot in the region of the fraenum glandis. A large number of sections were examined, some being unstained, others stained with neutral red, or a very weak haematoxylin solution. It may be said at once that the prolonged examination of a large number of sections negatives the supposition that there is any evidence of acquired disease. Everything points to the conclusion that it is a congenital defect. The whole surface is covered with stratified epithelium, the cells of which show no pathological alteration with the exception that in certain areas they are either not pigmented at all or not to the same extent as in the other parts. With a low power it is at once apparent that the demarcation of pigmented from unpigmented areas is not so sharp as one would be led to believe from the macroscopic examination, the pigmented areas passing gradually into the unpigmented. Even after an unpigmented area has been reached we find here and there single cells or groups of cells which show a certain amount of pigment. In the pigmented areas it is found that it is mainly the basal layer of the epithelium that is laden with the colouring matter which is of a sepia brown colour. In some places the whole of the protoplasm of the cell is filled with the granules. In other places the pigment accumulation appears to have taken place mainly round the nuclei. In the deepest pigmented parts pigment granules are also met with in several of the outer layers of the epithelial cells (see Plate μ). In the cutis opposite the pigmented parts are large numbers of branched chromatophores (melanoblasts) deeply pigmented with coarse granules. In some places it can be clearly seen that these chromatophores are in actual contact with the basal cells of the epithelium. In the unpigmented areas some of the cells contain granules, but always in less amount than in the pigmented. In examining the unpigmented areas from side to side parts are reached where, even with a $\frac{1}{12}$ oil immersion lens, it is impossible to find a single pigment granule. A careful search has also shown that corresponding with the unpigmented areas there is a great diminution or total absence of chromatophores in the cutis.

The origin of pigment in the skin has been the subject of extended inquiry, especially by Ehrmann, Riehl, Aeby, Karg, Koelliker and others (see Chapter IV of this monograph, pp. 183—194), and they have formed the opinion that the pigment in the epithelial cells is carried there by special connective tissue cells (chromatophores) which wander up to or actually in between the epithelial cells to supply the pigment. The non-pigmented areas with defective chromatophore accumulation in our specimen might be taken to favour this view. But as it has been indicated in dealing with this subject, this is to interpret an association as a certain causation, and later writers have brought strong evidence to show that pigment can be produced without the transfer by aid of chromatophores.

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ATLAS

PART I

PHOTOGRAPHIC PLATES A—Z AND AA—ZZ

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BEIGEL'S CASE.



(4)

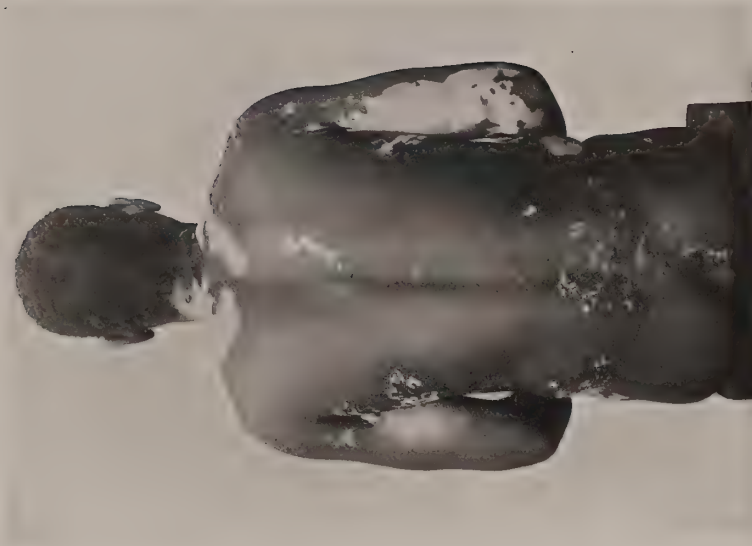


(5)

LEUCODERMA IN A NEGRO (SIR RICHARD BURTON'S CASE).



(6)



(7)



(8)

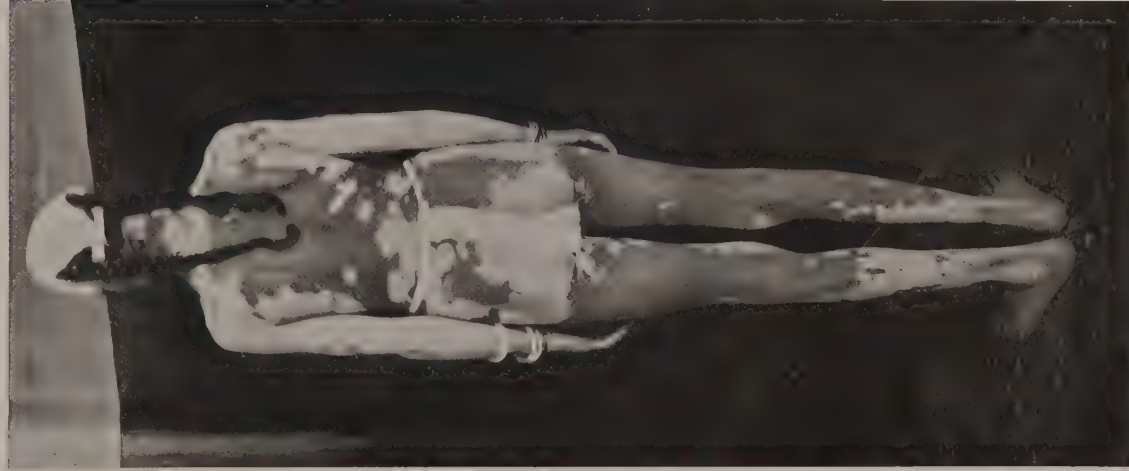
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LEUCODERMA IN SUDANESE, FIG. (8). (DR F. M. SANDWITH'S CASE.)

ALBINISM IN MAN.

PLATE D.



(9)



(10)



(11)

LEUCODERMA IN EGYPTIANS (DR F. M. SANDWICH'S CASES).



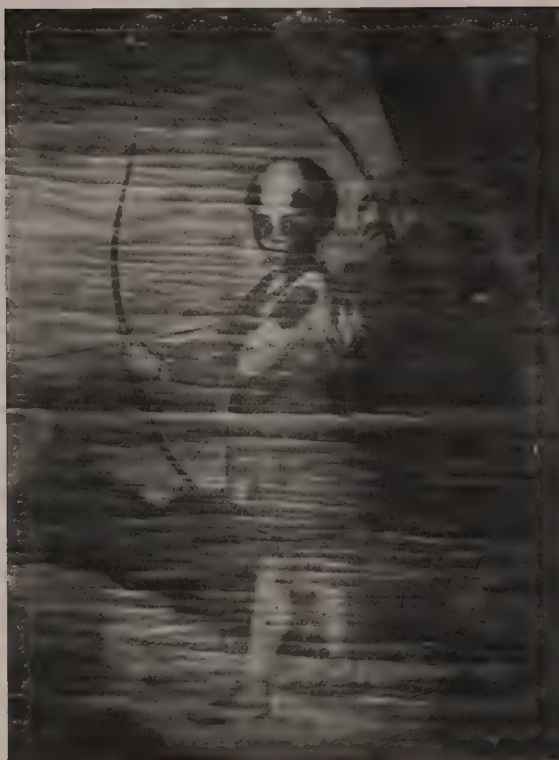
(12)



(13)



CAST OF PIED NEGRO CHILD AT ST THOMAS' HOSPITAL, LONDON. (14)



FROM A PICTURE AT MARLOW. (15)



THE SPOTTED BOY.

AFTER CHAMBERS. (16)



FROM A PRINT BY GREYTON. (17)



AFTER BUFFON. (18)

ALBINISM IN MAN.

PLATE G.



AFTER GRANGER.

(19)

PIED NEGRO (GRANGER-BLUMENBACH CASE).



(20)

AFTER BLUMENBACH.

ALBINISM IN MAN.

PLATE H.



(21)

MOTHER AND CHILDREN FROM NYASSALAND
(DR EMSLIE'S CASE).



(22)

INHERITANCE OF WHITE 'FLARE' (MR N. BISHOP HARMAN'S
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PARTIAL ALBINISM.



(23)



(24)



(25)

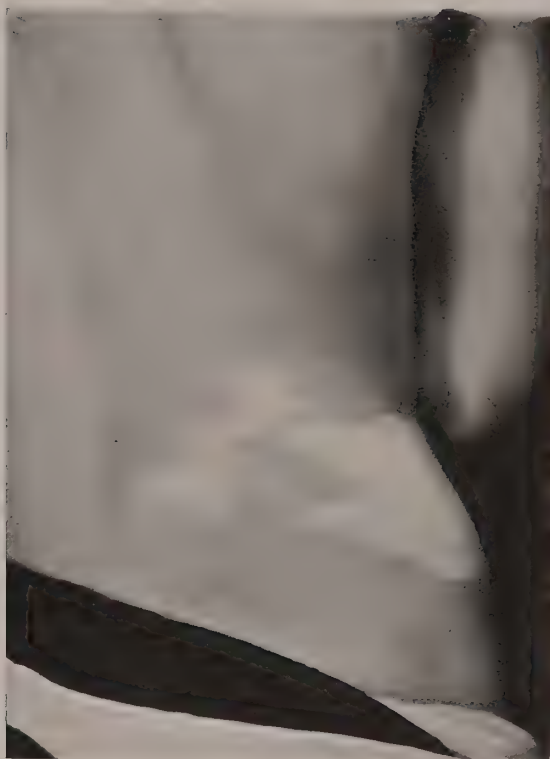


(26)

CONGENITAL PARTIAL ALBINISM IN PAPUAN BOY. PHOTOGRAPHS AT DIFFERENT AGES.



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(30)

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(34)

COMPLETE ALBINISM IN EUROPEANS, WOMEN.

ALBINISM IN MAN.

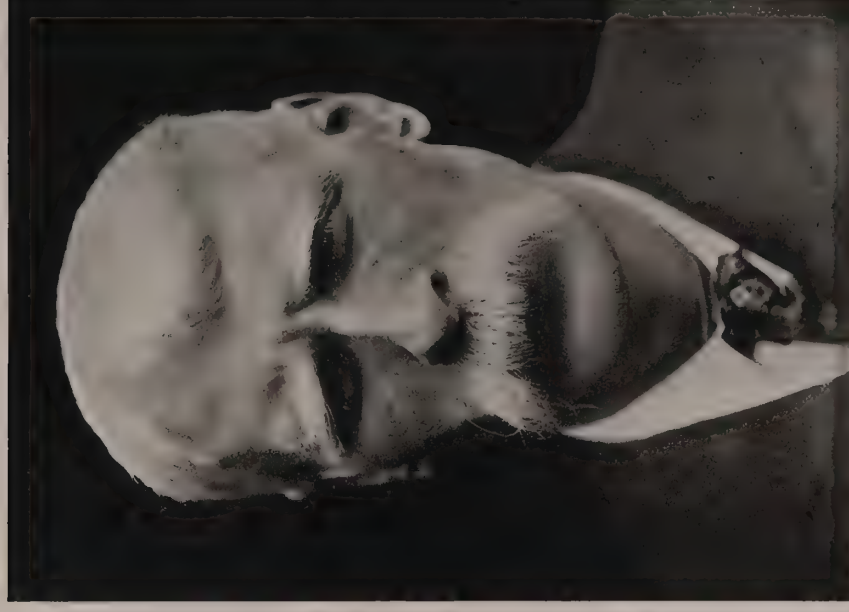
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(35)



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(37)

COMPLETE ALBINISM IN EUROPEAN MEN.



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(40)

EUROPEAN CHILDREN AND PARENTS.



(41)



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(43)

EUROPEAN ALBINOS, PARENTS AND CHILDREN.

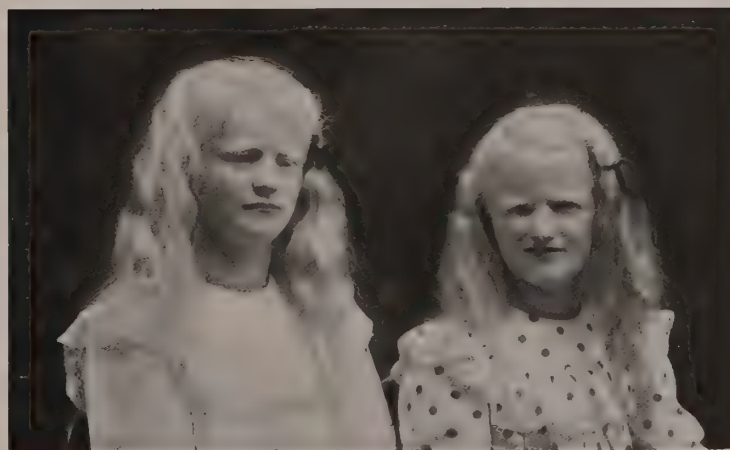


INCOMPLETE SCOTTISH ALBINOS (C. H. USHER'S CASE).

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NORWEGIAN ALBINOS, DR MAGNUS' CASE.
EUROPEAN ALBINOS, CHILDREN.

ALBINISM IN MAN.

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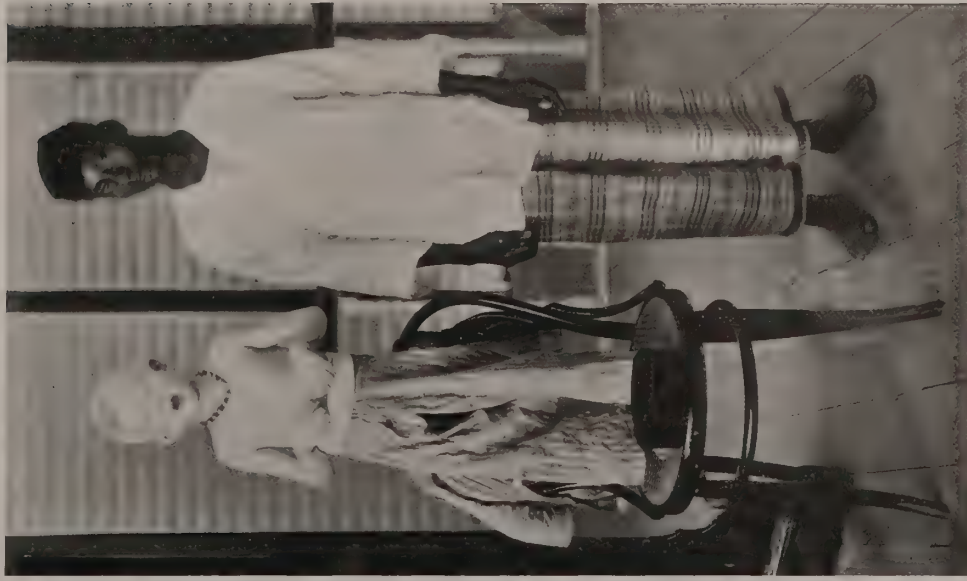


(47)

SINGHALESE ALBINO AND HIS BROTHER (SIR ALAN PERRY'S CASE, FIG. 9).



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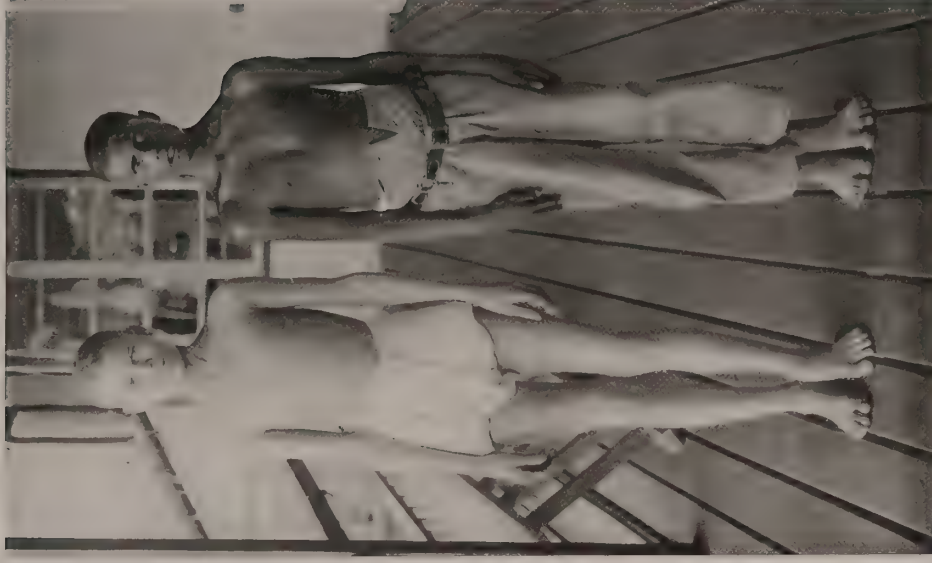
MALAY ALBINO (FIG. 353).



(50)

MALAY ALBINO (FIG. 353).

(DR FRASER'S CASES.)



(51)

TAMIL ALBINO (FIG. 418).



(52)

TATI AND HER MALAY HUSBAND (FIG. 351).



(53)

TIRIAH AND HER CHINESE HUSBAND (FIG. 350).



(54)

TATI AND TIRIAH, ALBINO MALAYS.
(DR FRASER'S CASES, FIGS. 350 AND 351).

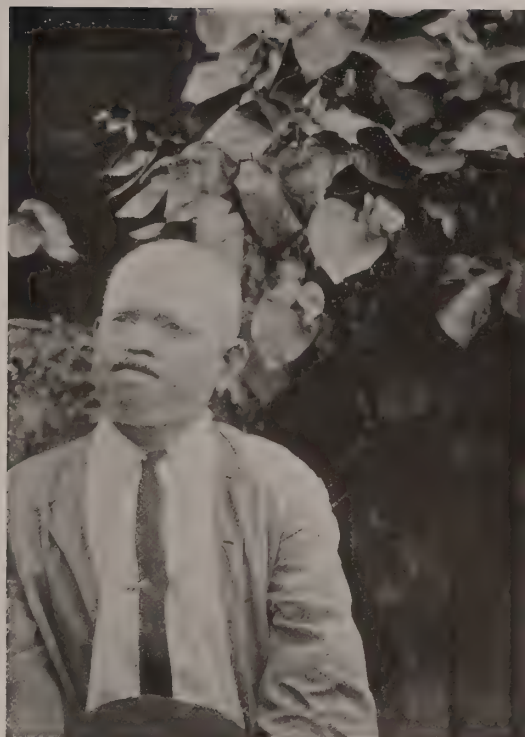


(55)

JAPANESE ALBINO BOY.
(PROFESSOR KOMATO'S CASE.)



(56)
NORMAL NATIVE AND MISIKINGI (FIG. 388).



(57)
ALBINO RUSIATI SEN FROM REWA (FIG. 390).



(58)
FIJIAN ALBINO CHILDREN AND THEIR
GRANDMOTHER. WAINIKITI LEWADAMU AND
LOUISA LAGIVORO (FIG. 329 *d*).



(59)
ALBINO GASAGASA AND HER MOTHER
(FIG. 329 *d*).

TYPICAL FIJIAN ALBINOS, SHOWING ABSENCE OF "FRECKLES" IN THOSE NOT EXPOSED TO THE SUN.



(60)

SITERI, FIJIAN ALBINO (FIG. 385).



(61)

SITERI, FIJIAN ALBINO.



(62)

SERA AND ASENE, FIJIAN ALBINOS (FIG. 444).



(63)

SERA AND ASENE, FIJIAN ALBINOS.

(C. H. USHER'S CASES.)



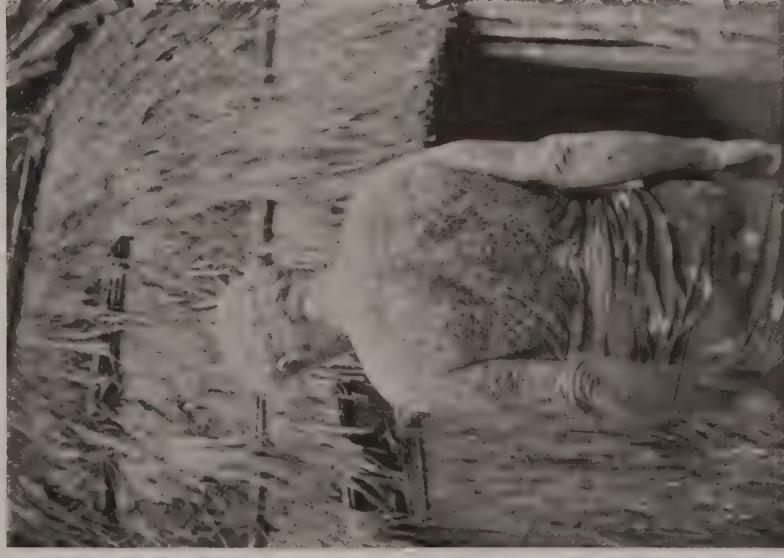
ISERELI NAVUNENE (FIG. 334). (64)



ETONIA BIAN (FIG. 444). (65)



SAMUELA NOVOCE (FIG. 386). (66)



ALBINISM IN MAN.

PLATE V.

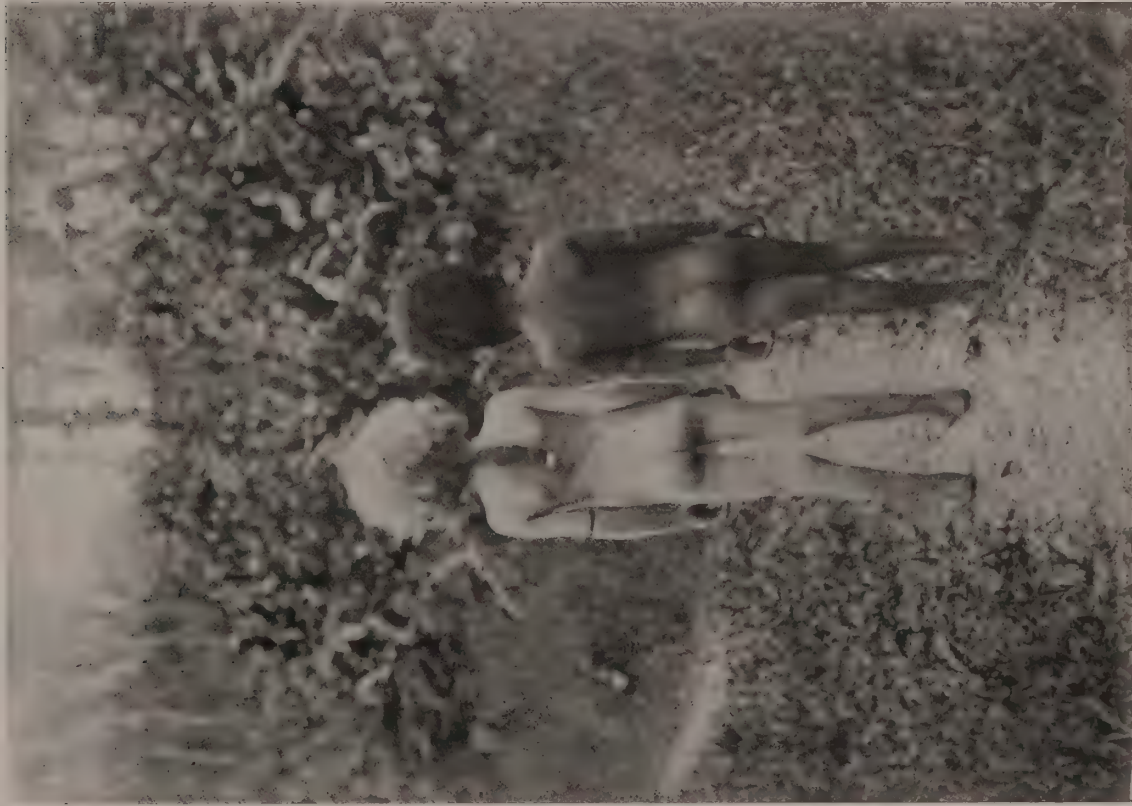


(70)

PAPUAN ALBINO BODOWA (MR J. TAAFFE'S CASE). NEW GUINEA. FIG. 417.



(71)



(72)

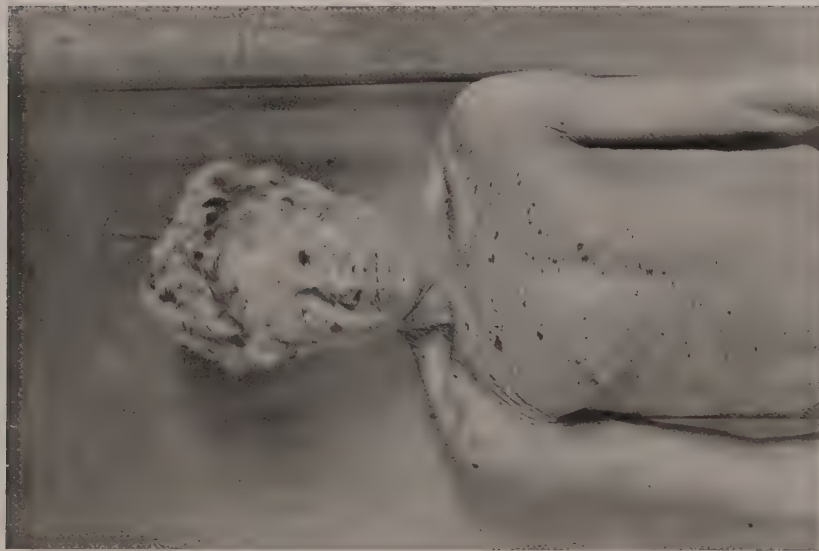
PAPUAN ALBINO BODOWA, BROTHER AND PARENTS (MR J. TAAFFE'S CASE), NEW GUINEA. FIG. 417.



(73)



WALLOULO (FIG. 347). (74)



WALLOULO (FIG. 347). (75)



DELIMILU (FIG. 348). (76)

NEW GUINEA ALBINOS (C. H. USHER'S CASES).



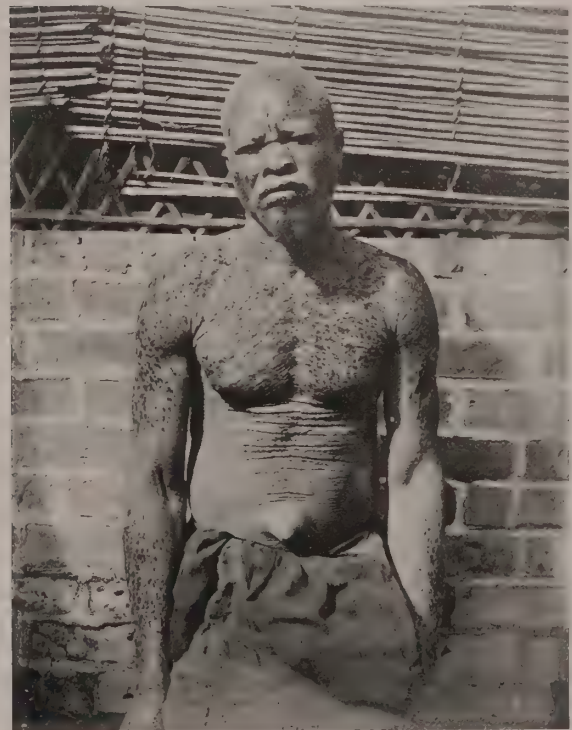
CHESIWANDIVI (FIG. 430). (77)



NYASSA ALBINOTIC WOMAN. (78)



ALBINO BABY (FIG. 431). (79)



NG'OMBE (FIG. 427). (80)

NYASSALAND ALBINOS (DR STANNUS' CASES).



MYTOPI ALBINO CHILD AND HIS FATHER (81)
(DR G. A. TURNER'S CASE).



SAME CHILD AND HIS MOTHER. (82)



(83)
BASUTO ALBINO BOY (CAPTAIN A. FISHER'S CASE).



(84)
NYASSALAND ALBINOS (DR STANNUS' CASES, FIG. 428).

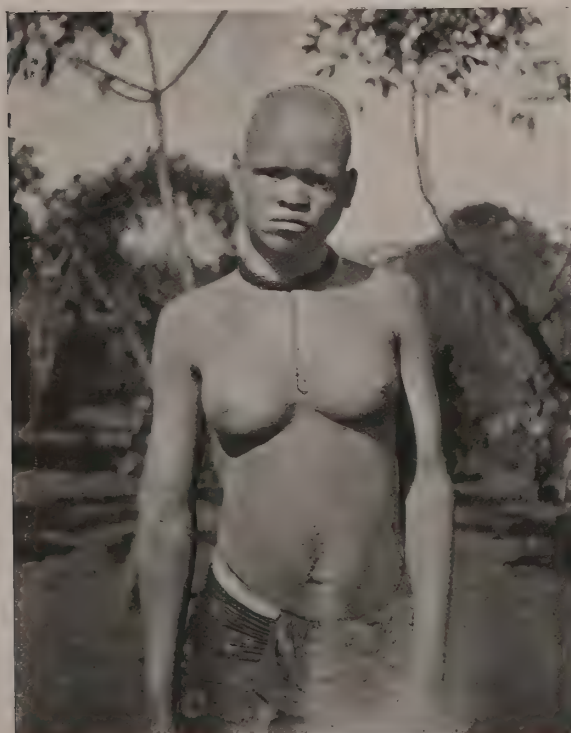


(85)

ALBINISM OF PENIS IN NEGRO (DR G. A. TURNER'S CASE).



ZULU ALBINO (DR C. WARD'S CASE, FIG. 38). (86)



MYAMBAAM ALBINO GIRL. (87)



(88)

SAME GIRL WITH OTHER MYAMBAAMS (DR G. A. TURNER'S CASE).

ALBINISM IN MAN.

PLATE BB.



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SHANGOAN ALBINO (DR G. A. TURNER'S CASE).



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(91)



(92)

XANTHOUS MYAMBAAM (DR H. TURNER'S CASE).



(93)

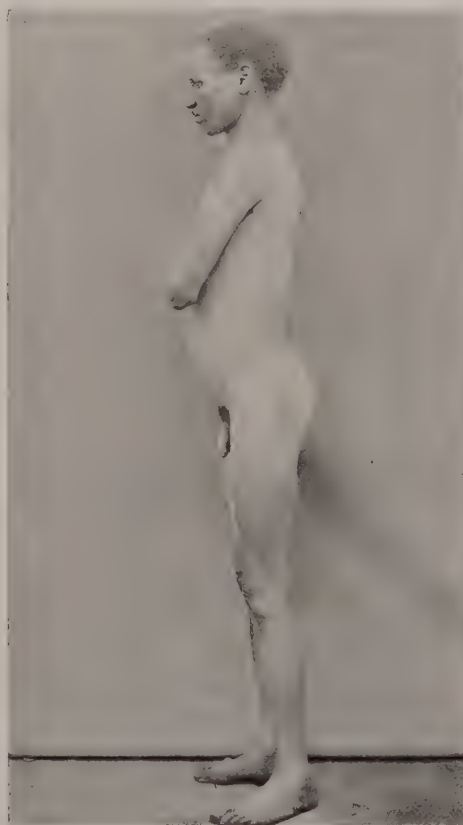


(94)

JAMAICAN NEGRO ALBINO BOY AND MOTHER (DR COSTA'S CASE).



(95)



(96)

MYAMBAAM NEGRO ALBINO (DR G. A. TURNER'S CASE).



ALBINO BANTU FROM PORTUGUESE CONGO (97)
(DR MERCIER GAMBLE'S CASE, FIG. 544).



(98)

BANTU ALBINO BABY AND PARENTS
FROM PORTUGUESE CONGO.
(DR MERCIER GAMBLE'S CASE, FIG. 554).



(99)

BANTU ALBINO BABY AND PARENTS
AS IN (98).
(DR MERCIER GAMBLE'S CASE, FIG. 554).



SIX ZUNI INDIAN ALBINOS, FROM A PHOTOGRAPH PROVIDED BY THE SMITHSONIAN INSTITUTION OF WASHINGTON, U.S. (100)



(101)

OKATANA, A PAPUAN ALBINO WITH NORMAL NATIVE FROM GAWA ISLAND (MR JOHN TAAFFE'S CASE. FIG. 541).



(102)

SYRIAN ALBINO FROM BEYRUT (REV. GEORGE MACKIE'S CASE).



(103)

MAORI ALBINO WITH WIFE, MOTHER AND CHILD (C. H. USHER'S CASE, FIG. 572).

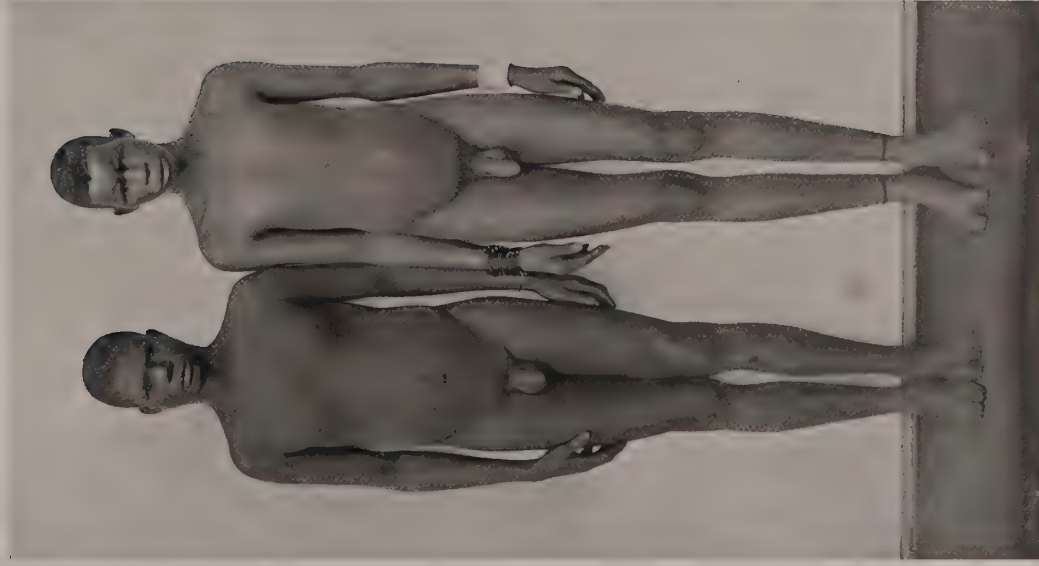


(104)

GILBERT ISLAND ALBINO (MR G. M. MURDOCH'S CASE).

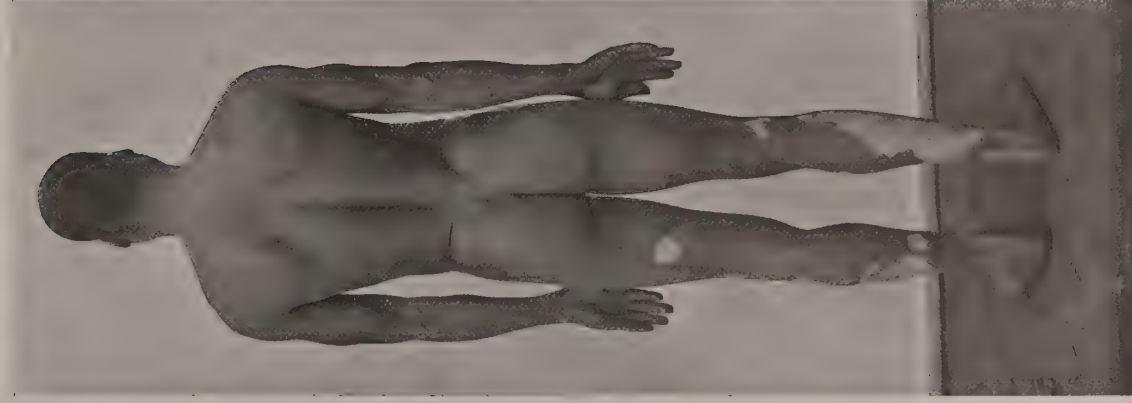
ALBINISM IN MAN.

PLATE HH.



(105)

MAGUMANE, A MYTOPI XANTHOUS NEGRO WITH NORMAL COLOURED NATIVE (DR G. A. TURNER'S CASE).



(106)

PARTIAL ALBINISM OF SKIN IN A MYTOPI (DR G. A. TURNER'S CASE).



(107)



(108)
ENGLISHMAN, HIS WIFE AN ALBINO NEGRESS, AND THEIR TWO MULATTO CHILDREN.
FROM THE PAINTING IN THE POSSESSION OF THE ROYAL COLLEGE OF SURGEONS.



(110)
ALBINISM IN AN INDIAN FAMILY. MAJOR GRAYFOOT'S CASE (FIG. 443).
REPRODUCED BY KIND PERMISSION FROM *THE POLYCLINIC*.



(109)
PARTIAL ALBINISM. SINGLE WHITE EYELASH.
C. A. USHER'S CASE (FIG. 562).



(111)

ALBINO LEVERETS (MR OXLEY GRABHAM, YORK).



(112)

ALBINO WEASEL (MR OXLEY GRABHAM, YORK).



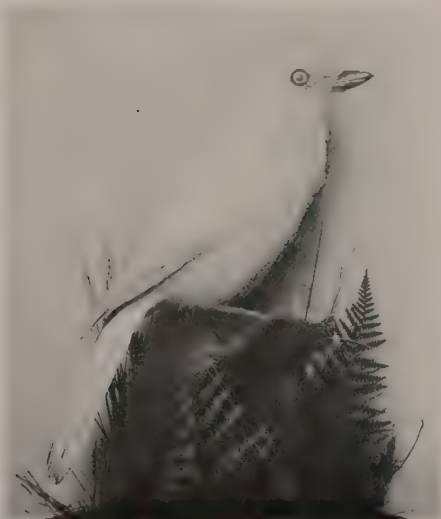
(113)

ALBINO PEKINESE SPANIELS (MR E. NETTLESHIP).



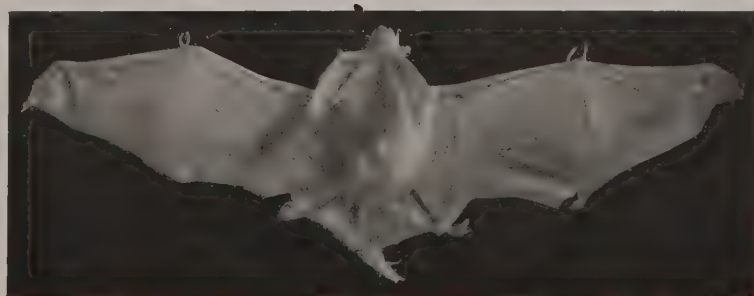
(114)

ALBINO HEDGEHOG (MR OXLEY GRABHAM, YORK).



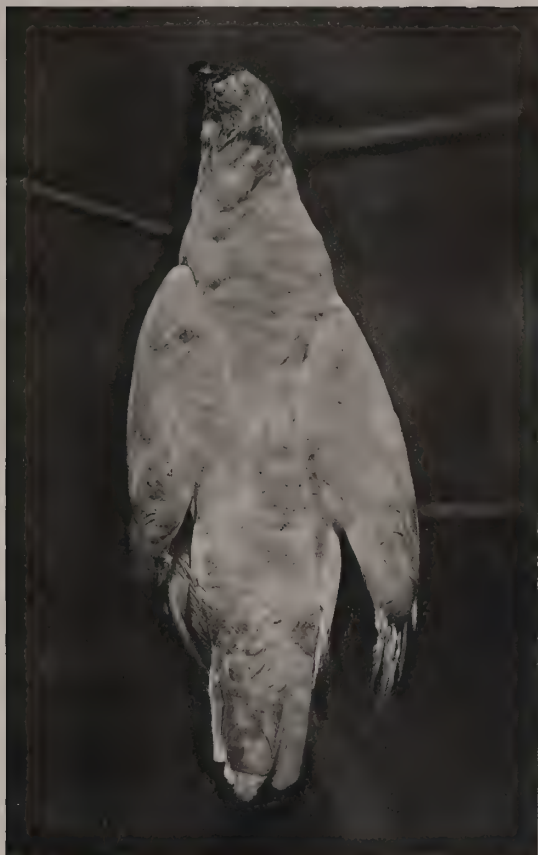
(115)

ALBINO JAY (MR OXLEY GRABHAM, YORK).



(116)

ALBINO LONG-EARED BAT (MR A. H. BARING, HAMPSHIRE).



ALBINO BLACK COCK. (117)



HEAD OF ALBINO GREY HEN. (118)



NORMAL BLACK COCK. (119)



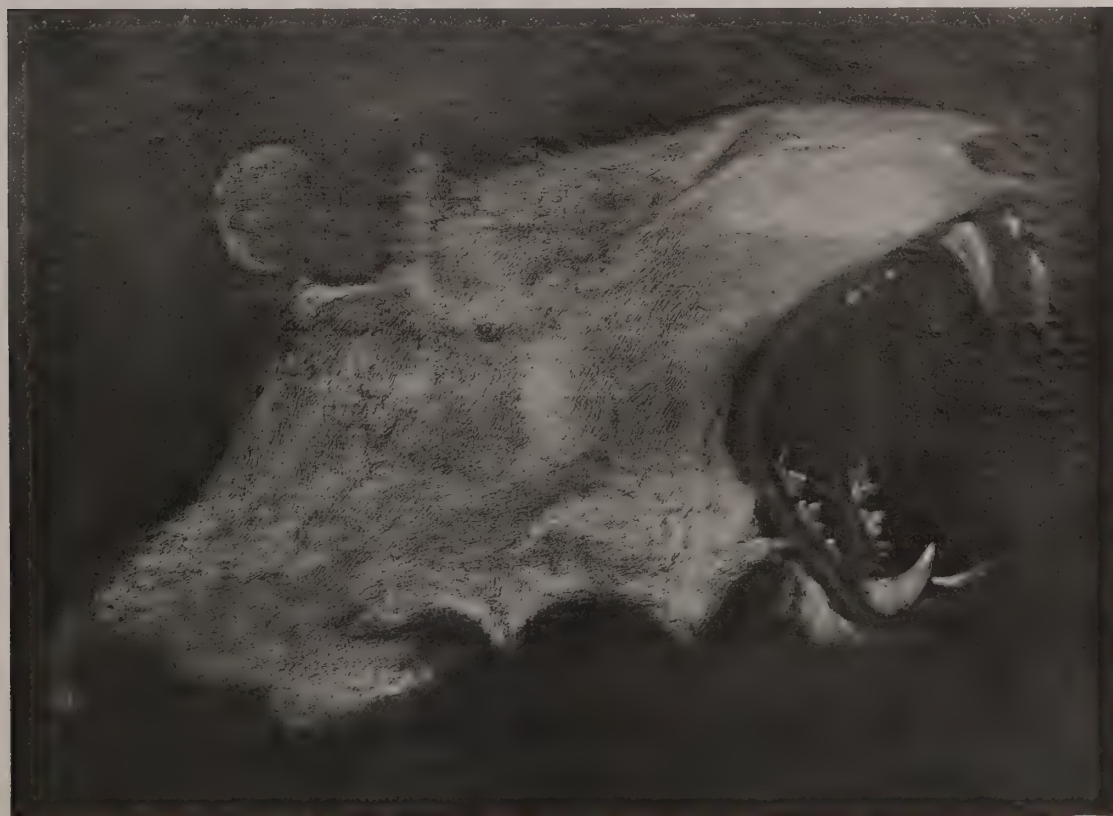
NORMAL GREY HEN. (120)

BLACK GAME (MR C. H. USHER).
ILLUSTRATIONS OF ALBINISM IN ANIMALS.



(121)

PARTIAL ALBINISM IN HORSES: DAM WITH FOAL AND YEARLING.



(122)

SIR EVERARD HOME'S ALBINO TIGER FROM THE PAINTING AT THE ROYAL COLLEGE OF SURGEONS.

ILLUSTRATIONS OF ALBINISM IN ANIMALS.



(123)

COMPLETE ALBINO WALLABY (*MACROPUS RUFICOLLIS BENNETTI*). BRITISH MUSEUM OF NATURAL HISTORY.



(124)

COMPLETE ALBINO MONKEY (*MACACUS CYNOMOLGUS*). BRITISH MUSEUM OF NATURAL HISTORY.



SEE FIG. 582. (125)



SEE FIG. 582. (126)



SEE FIG. 589. (127)



SEE FIG. 589. (128)

ZUÑI INDIAN ALBINS. HRDLÍČKA'S CASES. REPRODUCED BY KIND PERMISSION OF THE SMITHSONIAN INSTITUTION.



(129)

SYRIAN ALBINO GIRL WITH NORMALLY PIGMENTED BROTHER. DR MANASSEH'S CASE, FIG. 597, IV. 3.



(130)

NORWEGIAN ALBINO SISTER AND BROTHER (EARLY PORTRAITS). DR V. MAGNUS' CASE, FIG. 456.



(131)

SYRIAN ALBINO MAN, WITH NORMALLY PIGMENTED SYRIAN. DR MANASSEH'S CASE, FIG. 597, IV. 23.



(136)

NORMAL NORWEGIAN MOTHER WITH THREE ALBINO CHILDREN AND THEIR ALBINO SECOND COUSIN. DR V. MAGNUS' CASE, FIG. 634.



(134)

INCOMPLETE ALBINO GIRL AND HER NORMAL SISTER. USHER'S CASE, FIG. 639.



(132)

ALBINO RUSSIAN. DR SMIRNOFF'S CASE, FIG. 629. COMPARE WITH (133).



(133)

NORMAL RUSSIAN TO BE COMPARED WITH (132).



(137)

DEAF-MUTE ALBINO. DR HERON'S CASE, FIG. 649.



(135)

ALBINO FATHER AND SON, SCOTLAND. DR SOUTER'S CASE, FIG. 642.



(138)

TUFT OF BLACK HAIR ON HEAD OF DEAF-MUTE ALBINO, FIG. 649: SEE (137) ABOVE. COMPARE WITH CASE IN OUR FIG. 41.



(139)

NYASSALAND ALBINO CHILD, AGED 3, WITH
NORMAL MOTHER, AND OTHER CHILDREN.
DR DAVEY'S CASE, FIG. 630.



(140)

NYASSALAND NORMAL MOTHER AND ALBINO
CHILD. MRS YOUNG'S CASE: SEE TEXT,
P. 145 (? SAME AS (139)).



(141)

NORMAL NYASSALAND NATIVE, FOR COM-
PARISON WITH ALBINO NATIVE (142).

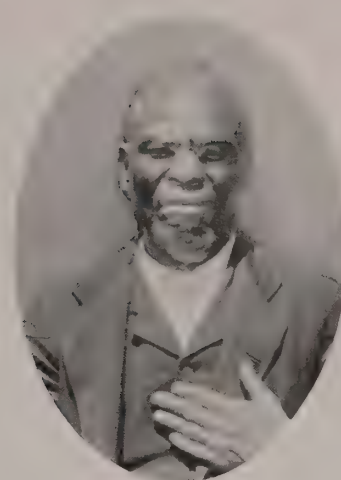


(142)

ALBINO NYASSALAND NATIVE. SKIN COVERED BY
UNPIGMENTED SMALL ELEVATIONS ("GOOSE SKIN").
DR ROBERTSON'S CASE, FIG. 648. Cf. (141).



(143)



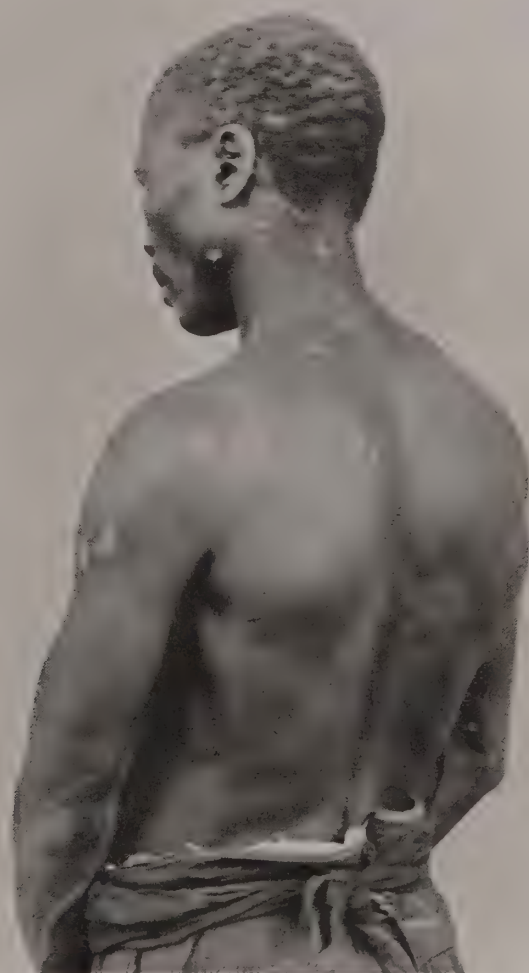
(144)

LEUCODERMA IN A KAFFIR, WITH RECOVERY OF PIGMENTATION. THE PHOTOGRAPH (143), WITH FACE MAINLY WHITE WITH BLACK SPOTS, IS AN EARLIER STAGE THAN (144), WHERE THE BLACK PIGMENTATION HAS AGAIN BECOME CONTINUOUS. DR REINHARD'S CASE. ORIGINAL PHOTOGRAPHS SENT BY DR REINHARD, THROUGH DR TURNER OF JOHANNISBERG. SEE THE CHAPTER ON LEUCODERMA.



(145)

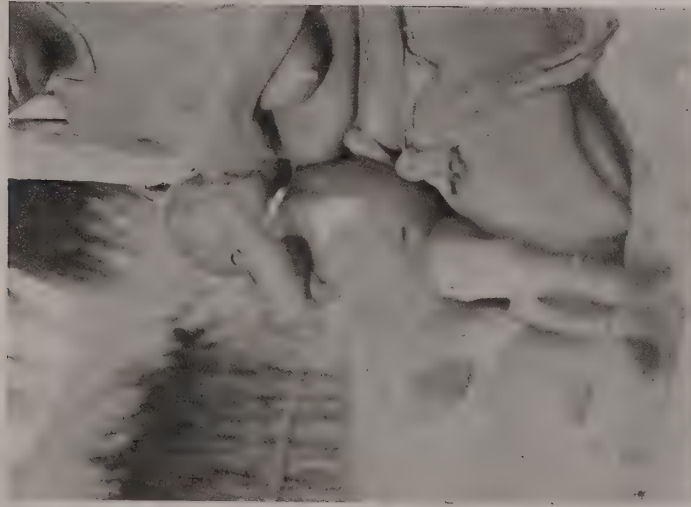
UNI-LATERAL LEUCODERMA, FRONTAL VIEW.



(146)

UNI-LATERAL LEUCODERMA, DORSAL VIEW.

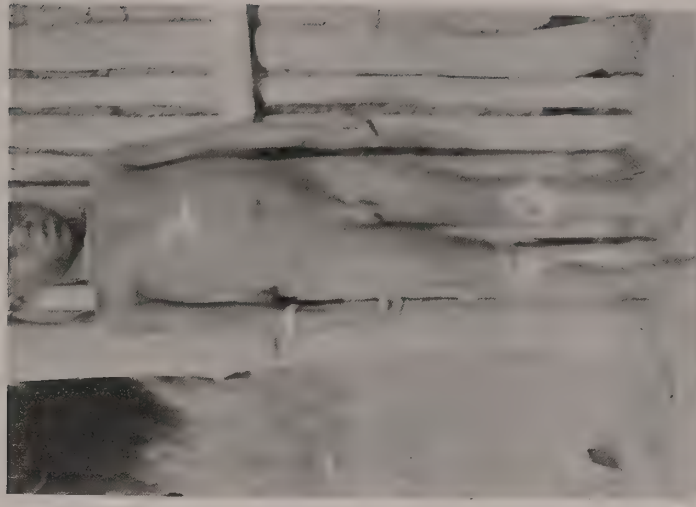
LEUCODERMA IN A NATIVE M'SUTO. DR MAYNARD'S CASE. THE LESIONS ARE STRICTLY UNI-LATERAL. IN THE DORSAL VIEW IT APPEARS AS IF SOME SPOTS WERE ON THE RIGHT OF THE MIDDLE LINE, BUT DR MAYNARD STATES THAT THIS IS NOT SO. SEE THE CHAPTER ON LEUCODERMA.



CHISIANJI, AGED 1½ YEARS, (147)
AND NORMAL MOTHER.



MAYERHERI, AGED 14 YEARS. (148)



THOMAS, AGED 4 YEARS. (149)



NORMAL MOTHER LUCY, MAYERHERI (150)
AND CHISIANJI. (AGED 5 YEARS).

FURTHER PHOTOGRAPHS, SENT BY DR H. STANNUS, OF THE PIEBALDS FROM NYASSALAND: SEE PLATE H (21). THESE PHOTOGRAPHS CARRY THE CHARACTER DOWN AN ADDITIONAL, *z.e.* FIFTH, GENERATION. LUCY, THOMAS AND CHISIANJI ARE CHILDREN, MAYERHERI, A BROTHER OF SANLOE, THE PIED NEGRO ON THE LEFT OF DR EMSLIE'S PHOTOGRAPH (21).



(151)
ORIGINAL PICTURE OF MARIA SABINA IN THE POSSESSION OF THE ROYAL COLLEGE OF SURGEONS. REPRODUCED FIRST BY BUFFON: SEE THE PLATE F (18) AND CHAPTER ON PIEBALDS, CASE (3).



(152)
DA ROCHA'S PIED NEGRESS FROM THE PICTURE IN THE LABORATOIRE DE PARASITOLOGIE, PARIS, FROM A BLOCK KINDLY LENT BY PROFESSEUR R. BLANCHARD: SEE THE CHAPTER ON PIEBALDS, CASE (10).



(153)
PHOTOGRAPH OF A PIED NEGRO BOY PRESENTED BY CHARLES DARWIN TO THE ROYAL COLLEGE OF SURGEONS: SEE THE CHAPTER ON PIEBALDS, CASE (12).

ALBINISM IN MAN.

PLATE TT.



(154)

WAX MODEL OF THE PIED NEGRO GIRL ADELAIDE FROM ST LUCIA, NOW IN THE MUSEUM OF THE HARVARD MEDICAL SCHOOL AT BOSTON, U.S.A.: SEE THE CHAPTER ON PIEBALDS, CASE (7).



(155)



(156)



LE MASURIER'S PAINTINGS, 1782, OF THE PIED NEGRO GIRL ADELAIDE: SEE THE CHAPTER ON PIEBALDS, CASE (7). WE HAVE TO THANK THE PUBLISHERS OF *LA NATURE* FOR THE PERMISSION TO REPRODUCE (157).

(157)



(158)

THE THREE STRIPED GRACES: SEE CHAPTER ON PIEBALDS AND FIG. 509.
REPRODUCED BY KIND PERMISSION OF SIR JONATHAN HUTCHINSON FROM
A PHOTOGRAPH GIVEN TO HIM BY PROFESSOR NEISSER.



(159)

NYASSALAND ALBINO WITH FATHER, MOTHER, NORMAL SIBLING AND MATERNAL
GRANDMOTHER WITH WHITE HAIR (? SENILE), DR DAVEY'S CASE.



ALBINO CHINESE WOMAN FROM WUCHANG, DR MERRINS' CASE. (160)



(161)

CHINESE ALBINO, NING FUH TAI,
FROM HANKOW, DR A. H.
SKINNER'S CASE.



(162)

CHINESE PIEBALD (?) FROM KWANGTUNG,
DR COUSLAND'S CASE. PHOTOGRAPH
THROUGH DR G. DUNCAN WHYTE.



(163)

CHINESE ALBINO FROM HANYANG,
DR A. H. SKINNER'S CASE.



(164)

CHINESE ALBINO (161) ALONGSIDE NORMAL CHINESE COOLEY. FROM PHOTOGRAPHS
BY DR A. H. SKINNER.



(165)

THE LEOPARD FAMILY AFTER GOULD AND PYLE. SEE PP. 203, 242, 249 AND CF. PLATE VV (158).



(169)

THE MADRID PIEBALD FROM THE PICTURE BY DA ROCHA. CF. PLATE SS (152). SEE OUR P. 240.



(166)

FAMILY OF THREE ALBINOS WITH FATHER AND MOTHER FROM BROKEN HILL, RHODESIA. DR ALEX. BROWN'S CASE.



(167)

LEMISA BERT. DR JOSEPH JONES' "SPOTTED NEGRESS." SEE P. 204.



(168)

ALBINO CHILD IN "SPOTTED STOCK." FIG. 286, IV. 1. DR JOSEPH JONES' CASE.



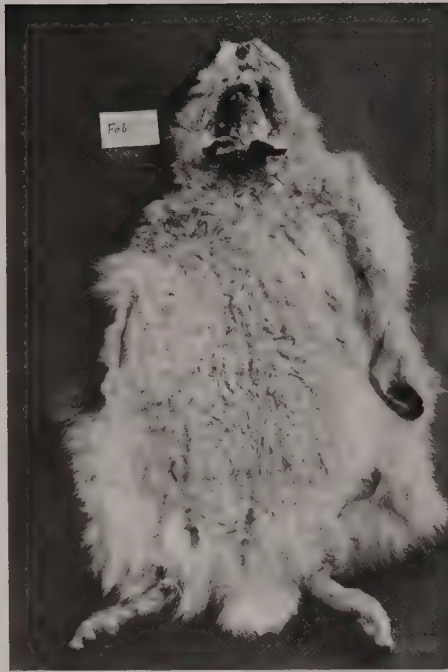
(170)

INDIAN ALBINO WOMAN FROM A PHOTOGRAPH SENT BY CAPTAIN W. F. HARVEY, I.M.S.



(171)

JANUARY COAT



(172)

FEBRUARY COAT



(173)

MARCH COAT



DECEMBER COAT



(182)

NOVEMBER COAT



(181)

OCTOBER COAT

(180)

PHOTOGRAPHS OF SCOTTISH VARIABLE HARE.



(174)

APRIL COAT



(175)

MAY COAT



(176)

JUNE COAT



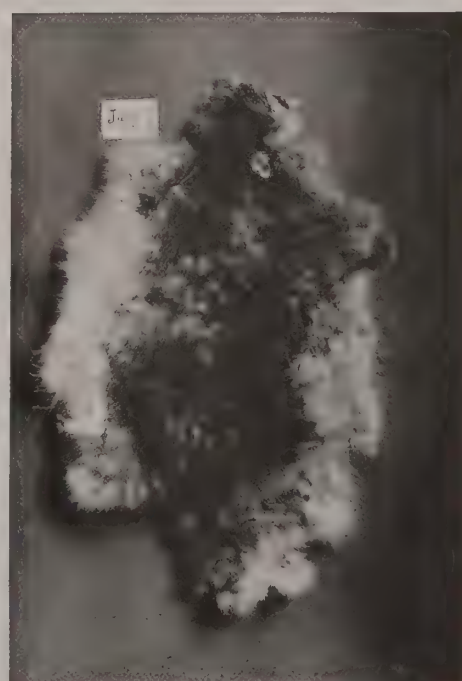
(179)

SEPTEMBER COAT



(178)

AUGUST COAT



(177)

JULY COAT

PHOTOGRAPHS OF SCOTTISH VARIABLE HARE.



(183)

AUGUST WHITE, PROBABLY ALBINO, *L. Variabilis*.
DARKER SPOTS ON COAT ARE BLOOD-CLOTS.



(184)

NORMAL JANUARY, ABNORMAL AUGUST AND NORMAL AUGUST.
SKINS OF *L. Variabilis*, TO SHEW TEXTURE OF ABNORMAL AUGUST HARE.



(185)

FEBRUARY COAT FEBRUARY COAT SEPTEMBER COAT SEPTEMBER COAT

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